Documentation

OpenStage WL 3 / OpenStage WL3 Plus WLAN Handset

Administration Manual

A31003-M2000-M100-1-76A9

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1 Introduction

1.1 About this document

Throughout this document you will find cross-references in the text which indicate further details that can be found in other sections of this document. The cross-references are colored blue and linked to the relevant place in the document. Positioning your cursor over the cross-reference text and clicking the left mouse button will take you to the relevant section.

To return to the original page after viewing a cross-referred page in Adobe Acrobat or Adobe Reader, click on the “Previous View” arrow (or).

This document is intended as a guide when installing the WLAN Handset in a VoWiFi system. The document describes the settings needed to make the handset function in a VoWiFi system and is relevant to the following personnel:

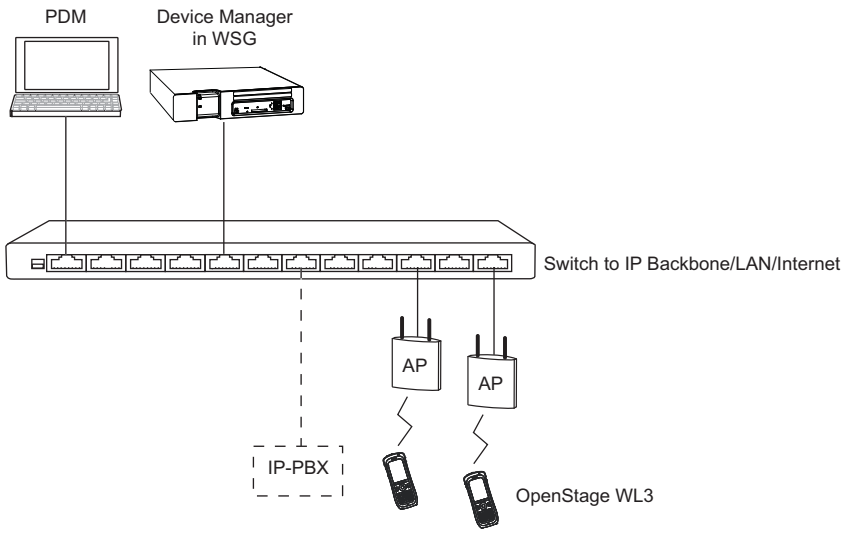
- System Administrator
- Service Technician

It is recommended that the reader has basic knowledge of the VoWiFi system and basic knowledge of handset registration in the PBX.

1.2 Short overview

The OpenStage WL3 Voice over Wireless Fidelity (VoWiFi) system provides wireless IP-telephony, messaging and alarm functions to enterprise LANs. Using third-party WLAN products as well as in-house developed hardware and software, the system enables data and voice transmission together with seamless roaming.

Figure 1 OpenStage WL3 VoWiFi System



First configuration is done using the Portable Device Manager (PDM). In small systems where it is possible to collect all handsets to update settings, daily maintenance is also done by using the PDM.OpenStage WL3 WSG Server (WSG) makes it possible to administrate the handsets centrally via a web interface without the need to collect the handsets.

The handset behavior can be customized to suite each user profile.

1.3 Functionality matrix

The following matrix shows which functionality that currently can be used by the different versions and requires settings in the PDM.

	WL3	**WL3 Messenger**	**WL3 Plus**
Company Phonebook	Yes	Yes	Yes
Central Phonebook	Yes	Yes	Yes
Centralized Management	Yes	Yes	Yes
Customized GUI	Yes	Yes	Yes
Interactive Messaging (IM)	No	Yes	Yes
Location	No	No	Yes
Push to Talk (PTT)	No	No	Yes
Multifunction button	Yes	Yes	No
Push Button Alarm	No	No	Yes
Man-down and No-movement alarm	No	No	Yes
Acoustic Location Signal (ALS)	No	No	Yes
Services	No	No	Yes
Voice Mail	Yes	Yes	Yes
Upload Language	Yes	Yes	Yes
Clear lists in charger	Yes	Yes	Yes

Table 1

The three versions WL3,WL3 Messenger Upgrade and WL3 Plus use the same hardware and software (except WL3 Plus, which uses a different hardware), and features are enabled by licensing. The WL3 version is an unlicensed WLAN Handset with basic functionality, and the WL3 Messenger UpgradeWL3 Plus versions are licensed WLANHandsets with additional functionalities such as messaging and alarm, respectively.

2 Pre-Installation

Before installing handsets in a VoWiFi system, make sure that all equipment is available. It is recommended to set up chargers and charge the handset batteries before installation, and to have a number plan available for the handsets. Also be sure that the IP addressing plan is set up to support the amount of handsets to be deployed.

We assume that the VoWiFi system is installed including some or all of the following components (depending on system configuration):

- DHCP Server. A DHCP server allows devices to request and obtain an IP address from a server which has a list of addresses available for assignment. If the WLAN does not have access to a DHCP server, a list of static IP addresses is necessary.
- Portable Device Manager. The PDM is used for administration and programming of the handsets. All settings and updates are in this case done via the DP1 Desktop Programmer cradle connected over USB.
- WSG. The WSG handles all communication between the WLAN and its built-in Device Manager. Before installing the handset, make sure the WSG IP address is available.

For effective administration of a VoWiFi system with several handsets, it is required to have both a PDM and a Device Manager included in the WSG. In this case, the PDM is only used to allow the handset to access the WLAN system. All other settings and updates are done with the Device Manager in the WSG.

2.1 VoWiFi System IP addresses

Complete the table below with the IP addresses, as a help when configuring the handsets.

Device	IP address/Number/Port	Required
IP-PBX		If used
WSG		If used
Subnet Mask*		If used
Number plan	N/A	Yes
NTP Server address**		
DNS Server address*		
VoIP settings***		Yes
Central Phonebook		If used
Syslog server		If used

Table 1

Device	IP address/Number/Port	Required
TFTP server		If used
Ekahau RTLS****		If used
DHCP range		

Table 1

* Only required if no DHCP is used, that is, static IP is used.
** Depending on system configuration
*** Gatekeeper IP address or SIP proxy IP address used to access the PBX.
****The IP address and port to the location server.

3 Programming the WLAN Handset

This chapter describes how to configure handsets in three different ways:

- It is possible to configure the handset by inserting it into a DP1 Desktop Programmer cradle connected via USB to the PDM.
- t is possible to configure the handset via over-the-air (OTA) using the Device Manager in the WSG.

  NOTE: This requires that the IP address to the WSG has been configured in the handset. The IP address is configured using PDM or via the handset's Admin menu.

- It is possible to configure the basic network settings of the handset via its Admin menu. See Section , "Administration", on page 1 for more information about the settings that can be made.

It is recommended to use the Device Manager in WSG to configure handsets in a large system. The reason is that it enables to install, upgrade and configure a large amount of handsets simultaneously. Another benefit is that the collection of the handsets from the user is not needed.

The PDM enables configuration of one handset at the time inserted in the DP1 Desktop Programmer connected via USB to the administrator's computer.

NOTE: It is recommended to use templates when configuring handsets. By using a template, the same configuration can easily be applied to many handsets simultaneously.

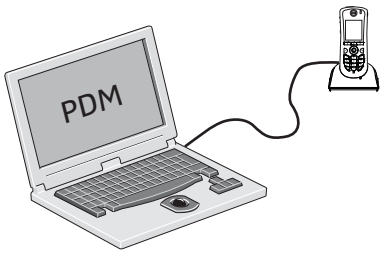
3.1 PDM

The PDM runs on a PC and is used for configuring the handset as follows:

- Connect a DP1 Desktop Programmer cradle via USB to the computer running PDM.
- Start PDM.
- Place the handset in this cradle connected to PDM.

For instructions on how to install and use the PDM, see Administration Manual for Wireless Gateway Server.

Configuration of handsets via PDM



3.2 WSG

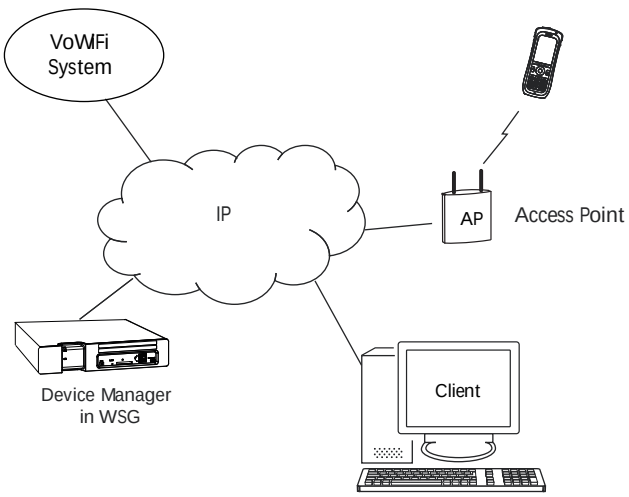
WSG runs on an ELISE3 module.

For instructions on how to use the WSG, see Administration Manual for Wireless Service Gateway.

3.2.1 Over-the-Air

There is no external equipment needed besides the Device Manager in WSG and VoWiFi system. Please proceed with Section , “Installation of WLAN Handsets”, on page 1.

Figure 1 Configuration of handsets via Over-the-Air (OTA)



4 Installation of WLAN Handsets

This section describes the recommended procedure for installing and configuring handsets. There are several ways to install a handset, but the procedures described here guarantees simple maintenance of the network.

It is recommended to use the Device Manager in WSG to install and maintain handsets in a large network. The reason is that it enables to install, upgrade and configure a large amount of handsets simultaneously. Another benefit is that the collection of the handsets from the user is not needed due to configuration is performed over the air (OTA). The handset must first be configured in the PDM to access the WSG later on.

The PDM enables administration of one handset at the time inserted in a Desktop Programmer (DP1) connected via USB to the administrator's computer.

Installation steps in large VoWiFi Systems using WSG and PDM

NOTE: If the handset to be installed must use certificate to access a WLAN, follow the instructions in chapter Section 4.2, "Installation without Central Device Management(WSG)", on page 5.

These WLAN settings are common network settings for all handsets.

1. Create templates in the Device Manager in WSG; one with network settings and another with common settings.
2. Create Numbers and apply the templates.
3. Create a template with identical network settings in the PDM.

See Section 4.1, "Installation with Central Device Management (WSG)", on page 1 for more information.

Installation steps in small VoWiFi Systems using PDM

1. Create Numbers.
2. Create one template for all settings in the PDM.

See Section 4.2, "Installation without Central Device Management(WSG)", on page 5 for more information.

4.1 Installation with Central Device Management (WSG)

When installing a large amount of handsets in a VoWiFi system, it is recommended to have both the WSG and the PDM to make the maintenance and handling of the system as simple as possible.

4.1.1 Create a Network Template in the WSG

Create one template that contains the network parameters (also include the security settings). Besides the network parameters, additional parameters might also be set, for example VoIP settings and IP address to WSG. The template must be created to prevent the WSG from restoring the parameters to default during the first synchronization.

NOTE: Only select the parameters that are changed, if all parameters are selected the system performance decreases.

---

1. Open a web browser and enter the address to the WSG.
2. Click “Device Manager“. You might be prompted to log on the Device Manager.
3. Select the Templates tab and click “New“. The New template window is opened.
4. In the Device type and Parameter version drop-down lists, select the corresponding device type and parameter version to use, respectively.
5. In the Name field, enter a descriptive name of the template.
6. Click “OK“.
7. Set the following network parameters:
   - Network settings[1] (located under Network > Network A, B, C, or D)
   - VoIP settings[2] (located under VoIP)
   - Syslog settings[3] (if any) (located under Device > General)
   - WSG settings[4] (located under Device > WSG)
8. Click “OK“ to save the template.

NOTE: **:** See Working with Templates for tip on how to work with templates when using both PDM and WSG.

---

1. All required system settings for the WLAN. For example SSID and Security mode.
2. For example VoIP protocol, Gatekeeper IP address or SIP proxy IP address used to access the PBX.
3. The parameter “Syslog“ must be enabled in order to set the “Syslog IP address“.
4. IP address and password (if any) to the WSG.

4.1.2 Create a Common Template in the WSG

Create another template with the common handset settings applicable to all handsets (exclude the parameters and security settings configured in the Network template). This template contains for example, hidden menu items in the display, certain level of ring signal and vibrators.

NOTE: Only select the parameters that are changed, if all parameters are selected the system performance decreases.

---

1. Open a web browser and enter the address to the WSG.
2. Click “Device Manager“.
3. Select the Templates tab and click “New“.
4. In the Device Type and Parameter version drop-down lists, select the corresponding device type and parameter version to use, respectively.
5. In the Name field, enter a descriptive name of the template.
6. Set the specific parameters. See section Section 4.4, “Configure a Handset with a Template”, on page 7 for more information.

4.1.3 Create Numbers in the WSG

Create a range of Numbers and apply the templates previously created in the WSG.

NOTE: Do not add numbers already used because these handsets already exist in the system although not saved in the Device Manager in WSG. The Device Manager will overwrite the existing parameters in the handset.

NOTE: The parameter version of the template must be equal to or less than the selected parameter version.

---

1. Open a web browser and enter the address to the WSG.
2. Click “Device Manager“.
3. Select the Numbers tab and click “New“. The New numbers window is opened.

4. In the Device Type and Parameter version drop-down lists, select the device type and the parameter version to use, respectively.

   NOTE: The device type and parameter version must match the handsets to be used to apply the template.

5. In the Prefix field, enter the numbers' prefix (if needed).
6. Create a range of numbers by selecting the "Range" option. Enter the start call number and the end call number in the fields, respectively. Click "OK".

   NOTE: The maximum range that can be added at a time are 100 numbers.

7. Apply the network settings template to the selected handsets. See Section 4.4.2, "Apply a Template to a Handset with a Number", on page 8.
8. Apply the common settings template to the selected handsets. See Section 4.4.2, "Apply a Template to a Handset with a Number", on page 8.
9. Close the WSG.

4.1.4 Create a Network Template with Initial Configuration in the PDM

In a factory delivered handset, the WLAN settings are not configured that is required to access the WSG. Using the PDM allows the handset to be primed with the WLAN parameters and allows it to log in to the Device Manager in WSG for future management over the air.

Create a template with the basic network settings and IP address to WSG. This template is only used once for each handset since it must access the WLAN and then log on the Device Manager. After log in, the settings in the handset are changed according to the templates in the Device Manager in WSG.

1. Open the PDM.
2. Do one of the following:
   - If a network template was created in the Device Manager in WSG, export this template and import it to PDM. See Working with Templates for more information. (Recommended)
   - Create a template (see Section 4.4.1, "Create a template", on page 8) with the following network parameters:

     - Network settings* (located under Network > Network A (B, C, or D)

     - WSG settings** (located under Device > WSG)

Note: The parameters in this template should be identical to the parameters in the network template created in the WSG.

* All required system settings for the WLAN. For example SSID and Security mode.
** IP address and password (if any) to WSG.

3. Put the handset in the Desktop Programmer (DP1) cradle.
4. Run the template. See Section 4.4.3, “Apply a Template to a Handset without a Number”, on page 9.
5. Remove the handset when synchronization is finished.
6. Enter the Number and the password [1] (if any). Press “Login“.

   Settings that were stored for the handset in the Device Manager in WSG will now be downloaded to the handset. This can, for example, be unique soft- or hot keys that have been prepared earlier. When the settings have been downloaded to the handset, it might be restarted depending on the parameter changes.
7. Repeat step 3 – 6 for all handsets.

4.2 Installation without Central Device Management(WSG)

In a small VoWiFi system, the administration can be handled using only the PDM.

The synchronization is in this case not handled automatically by the system when a handset’s parameters are changed in the PDM. When the parameters have been changed in PDM, each handset must be placed in the Desktop Programmer (DP1) cradle connected to the administrator’s computer in order to synchronize the parameters with the handset.

1. Open the PDM.
2. In the Numbers tab, click “New“. The New numbers window is opened.
3. In the Device Type and Parameter version drop-down lists, select the matching device type and the parameter version for the handset to be use, respectively.
4. In the Prefix field, enter the numbers’ prefix (if needed).
5. Create a range of numbers by selecting the “Range“ option. Enter the start call number and the end call number in the fields, respectively.
6. Click “OK”.
7. Create a network settings template (see Section 4.4.1, “Create a template”, on page 8) with the following network parameters:
   - Network settings[2] (located under Network > Network A, B, C, or D)

1.The password is only required if the “Password“ parameter is set.

8. Create another template (see Section 4.4.1, “Create a template”, on page 8) with the common handset settings applicable to all handsets (exclude the network parameters and used security settings). Example of parameters settings:
   - VoIP settings[1] (located under VoIP)
   - Software TFTP IP address (if any) (located under Device > General)
   - Syslog settings[2] (if any) (located under Device > General)

   In addition, settings for hiding menu items in the display, certain level of ring signal and vibrators etc. can also be configured.
9. Apply the network settings template to the handset, see Section 4.4.2, “Apply a Template to a Handset with a Number”, on page 8.
10. Apply the common settings template to the handset, see Section 4.4.2, “Apply a Template to a Handset with a Number”, on page 8.
11. Put the handset in the Desktop Programmer (DP1) cradle.
12. In the Device Wizard window, select “Associate with number“ and press “OK“.
13. Select the handset to associate with. Press “OK“.

The number and parameter settings saved in the PDM will now be synchronized with the handset. In addition, the handset’s Device ID will also be synchronized with the number in the PDM.

If certificates must be used to access a VoWiFi system, also perform the steps 14 - 19.

14. In the Numbers tab, right-click the handset’s number and select “Edit certificates“. An Edit certificate window opens.
15. In the Root tab and Client tab, click “Edit“ and select the certificates to import. Click “Close“.
16. In the Numbers tab, right-click the handset’s number and select “Edit parameters“.
17. Select “Network X“ (X represents A, B, C, or D).
18. In the Security mode drop-down list, select “EAP-TLS“.
19. In the EAP client certificate drop-down list, select the client certificate to be used. Click “OK“.
20. Remove the handset when synchronization is finished.

Repeat the steps 11-13, 20 (if needed, perform the steps 14-19) for all handsets.

2. All required system settings for the WLAN. For example SSID and Security mode.
1. VoIP protocol, Gatekeeper IP address or SIP proxy IP address used to access the PBX.
2. The parameter “Syslog“ must be enabled in order to set the “Syslog IP address“.

4.3 Installation using the Handset's Admin Menu

It is possible to install a handset using its Admin menu. This is useful when no PDM or WSG is available and the handset needs to be installed quickly.

NOTE: It is only possible to configure the basic settings via the Admin menu.

---

1. There are two options to access the Admin menu:
   - If the handset has been factory reset or not been configured; in idle mode, enter 40022.
   - If the handset has been configured; press "Menu", select "Settings" and enter 40022.
2. Set the following parameters:
   - Network settings[1] (located under Network setup)
   - VoIP settings[2] (located under VoIP)
   - WL3 settings[3] (if any) (located under WL3)
   - Syslog settings[4] (if any) (located under Syslog)
   - Add license key (if any) (located under Enter license key)

4.4 Configure a Handset with a Template

It is possible to select a handset in the PDM and directly change one or more configuration parameters. By using a template, the same configuration can easily be applied to many handsets simultaneously. Templates are also an efficient way to give good control over which changes that are applied to each handset.

Templates enables configuration of all aspects of a handset from sound volume to keypad short cuts.

Your supplier can provide example templates for different PBX:s. The handset will have full functionality towards the PBX even without such a template. By using such a template, though, the handset will be customized for that PBX with menu options for PBX specific functions.

1. All required system settings for the WLAN. For example SSID and Security mode
2. VoIP protocol, Gatekeeper IP address or SIP proxy IP address used to access the PBX.
3. IP address and password (if any) to the WSG.
4. The parameter "Syslog" must be enabled in order to set the "Syslog IP address".

4.4.1 Create a template

1. Open the PDM or the Device Manager in the WSG.
2. Select the Templates tab and open the menu “Template > New...“. The New Template window is opened.
3. Select the device type and parameter version that matches the software version installed on the handset. Give the template a descriptive name.

The parameters that are not part of the template will be left unchanged on the handset. The parameter version of an installed handset is visible under the Numbers tab or the Devices tab.

4. Click “OK“.
5. Select the check box of each parameter that you want to be part of this template and enter the proper value.
6. Click “OK“ to save the template.

4.4.2 Apply a Template to a Handset with a Number

1. Open the PDM or the Device Manager in the WSG.
2. In the Numbers tab, select the handset(s) you want to apply the template to.

NOTE: If several handsets shall be selected, they must be of the same device type and have the same parameter version.

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3. Make a right-click and select “Run template...“.

Only templates with a parameters version matching the selected handsets will be shown. Select the template you want to apply and click “OK“.

The template is applied. The number of parameters in the template will affect the time it takes to apply the template to the selected handsets.

When looking at a handset under the Numbers tab, the column “Last run template“ will show the name of the most recently applied template.

This function cannot be used to download certificates to the handsets.

4.4.3 Apply a Template to a Handset without a Number

NOTE: This feature is only applicable for the PDM. However, in the Device Manager inWSG, it is possible to apply a template to a handset without a number using the Baseline function. The Baseline function or a template cannot be used to download certificates to the handsets. See Installation and Operation Manual, WSG, TDXXXXX.

It is possible to apply a template to a handset without a number in the PDM.

1. Put the handset in the Desktop Programmer (DP1) cradle.
2. In the Found Device Wizard window, select the “Run template“ option.
3. Click “Next >“.

Only templates with a parameter version matching the selected handset will be shown.

4. Select the template that shall be applied and click “OK“.

The template is applied. The number of parameters in the template will affect the time it takes to apply the template to the selected handset.

4.4.4 Save Handset Configuration as a Template

It is possible to save all settings of a handset as template. Note that this does not include contacts, certificates and other personal data. The template will only contain configuration data.

This template can be used as a backup if you want to restore the configuration of the handset at a later stage or as a template that can be applied to a number of handsets.

1. Open PDM or the Device Manager in the WSG.
2. In the Numbers tab, select the handset you want to save as a template.
3. Make a right-click and select “Use as a template...“. Enter a descriptive name for the template.
4. The Edit template window is opened. By default, all parameters are selected and are saved when clicking “OK“.

   If one or more parameters should be excluded, remove them by clearing the check box next to the parameter.

Some parameters are user specific. If it is decided to apply this type of template to several handsets, it is recommended to exclude the following parameters:

- User display text - A text string displayed in idle mode. The parameter is located directly under “Settings“.
- Phone lock PIN code - The security code used to unlock the keypad. The parameter is located under Settings > Locks.
- Endpoint ID - The identity/name of the user registered in the PBX. The parameter is located under VoIP > General.

5. Click “OK“.

4.4.5 Synchronizing a Handset with PDM

After installing and saving a handset, it will be synchronized each time it is connected to the PDM. The synchronization transfers parameter changes between the handset and the PDM and vice versa as follows:

- If a parameter has been changed in the handset, it will be transferred to the PDMWSG.
- If a parameter has been changed in the PDMWSG while the handset was disconnected, it will be transferred to the handset.

If the same parameter has been changed in both the PDMWSG and the handset, the value in PDMWSG will be transferred to the handset.

4.4.6 Configure Handset without Saving It in PDM

It is possible to configure a handset without saving it in the PDM. An unsaved handset do not have the symbol ✓ in the Saved column. The settings in the handset can be synchronized and saved in the PDM later on. However, it is recommended to save the handset in PDM if backup is needed. For example when a handset needs to be replaced.

1. Put the handset in the Desktop Programmer (DP1) cradle.
2. Open PDM.
3. In the Numbers tab, select the unsaved handset you want to configure.
4. Select Number > Edit parameters.
5. The Edit parameters window is opened. Edit the parameters of the handset and click “OK“.

6. Remove the handset from the Desktop Programmer (DP1) cradle. The handset is no longer visible in the PDM and the settings are only saved in the handset.

5 Maintenance

5.1 Handset

In an existing VoWiFi system it is important to be able to replace handsets, install new handsets and exchange faulty handsets. The recommended procedure is to use a template with basic network settings for log in, created in the PDM, and then get the rest of the settings that were created by the templates in Device Manager in WSG

Another important matter is to be able to upgrade system parameters and security settings in the handsets. These upgrades are preferably done in the WSG if available.

If PDM and WSG are used, do one of the following:

- If you want to install new handset, see Section 4.1, “Installation with Central Device Management (WSG)”, on page 1.
- If you want to create spare handsets to be used when broken handsets need to be replaced later on, see Section 5.1.1, “Configure Spare Handsets without a Number in Large Systems”, on page 1.

If only PDM is used, do one of the following:

- If you want to install new handset, see Section 4.2, “Installation without Central Device Management(WSG)”, on page 5.
- If you want to replace a broken handset, see Section 5.2.4, “Replacement of Handset with PDM Only”, on page 13.

5.1.1 Configure Spare Handsets without a Number in Large Systems

In large systems where WSG is used, it is recommended to configure a couple of spare handsets without a number in order to quickly replace a broken handset later on.

Create a Template

1. Open PDM.
2. Select the Templates tab and click “New“. The New template window is opened.
3. In the Device type and Parameter version drop-down lists, select the matching device type and parameter version for the spare handset to use, respectively.
4. In the Name field, enter a descriptive name of the template.

5. Click “OK“.
6. Set the following network parameters:
   - Network settings[1] (located under Network > Network A, B, C, or D)
   - VoIP settings[2] (located under VoIP)
   - Syslog settings[3] (if any) (located under Device > General)
   - WSG settings[4] (if any) (located under Device > WSG)
7. Click “OK“ to save the template.

Apply Template to a Handset without a Number

1. Put the handset in the Desktop Programmer (DP1) cradle.
2. In the Found Device Wizard window, select the “Run template“ option.
3. Click “Next >“.

Only templates with a parameter version matching the selected handset will be shown.

4. Select the template that shall be applied and click “OK“.

The template is applied. The number of parameters in the template will affect the time it takes to apply the template to the selected handset.

5. Switch off the handset when User name and Password are displayed.

Tip: If the handset shall replace a broken handset, continue with Section 5.2.2, “Replacement of Handset with WSG”, on page 9.

5.1.2 Upgrade Handset Software

NOTE: Pay attention to the software Release Notes before changing the software.

The handset software can be upgraded over the air using Centralized Device Management (WSG) or a TFTP server, or by cable using PDM.

1. All required system settings for the WLAN. For example SSID and Security mode.
2. For example VoIP protocol, Gatekeeper IP address or SIP proxy IP address used to access the PBX.
3. The parameter “Syslog“ must be enabled in order to set the “Syslog IP address“.
4. IP address and password (if any) to the WSG.

5.1.3 Upgrade Software OTA via TFTP

Software upgrade OTA via TFTP is used in small VoWifi systems and is recommended to use if no WSG is available. The benefit is that the handsets do not need to be collected by the administrator since the software upgrade is performed over the air.

In order to upgrade the software via TFTP, the following must be done:

1. If needed, the handset must be configured in PDM to access a TFTP server, seeSection 5.1.3, “Configure Access to the TFTP Server”, on page 3.

   Tip: It is recommended to configure the TFTP server’s IP address when installing the handsets. See Section 4.2, “Installation without Central Device Management(WSG)”, on page 5.

2. If needed, a new software information file (packageinfo.inf) and a software (.bin) file must be uploaded to the TFTP server. These files are provided by your supplier. First rename the .pkg file to .zip and then unzip. Then the needed .inf and .bin files are available.

   See the manual for the TFTP server used for more information on how to upload files.

3. The handset must be restarted. When the handset has been restarted, it connects to the TFTP server and downloads the software information file (.inf) that contains information about the software version. If the software version differs from the handset’s software version, the handset will download the software file (.bin) from the TFTP server. The handset will be restarted when the software upgrade is performed.

Configure Access to the TFTP Server

1. Put the handset in the Desktop Programmer (DP1) cradle.
2. Open the PDM.
3. Open the Numbers tab and select the handset.
4. Make a right-click and click “Edit parameters“.
5. Select Device > General.
6. In the Software TFTP IP address field, enter the IP address to the TFTP server.
7. Click “OK“.

5.1.4 Upgrade Software via PDM

Software upgrade via PDM is used in small VoWiFi systems. The handsets need to be collected by the administrator due to the software upgrade is performed via the connected to PDM.

1. Open the PDM.
2. In the Devices tab, right-click the handset to be upgraded. Select “Upgrade software...“.
3. In the Available files drop-down list, select the desired software file (.bin).

   If needed, import the software file to be used by clicking “Import“. Locate the software file (.bin or .pkg) and click “Open“.
4. Click “OK“.

5.1.5 Upgrade Software Over the Air (OTA) via Centralized Device Management (WSG)

Software upgrade via WSG is used in large VoWiFi systems. The benefit is that the handsets do not need to be collected by the administrator due to the software upgrade is performed over the air (OTA).

1. Open the Device Manager in the WSG.
2. Open the Devices tab and select the handsets to be upgraded.
3. Make a right-click and click “Upgrade software...”.
4. In the Available software drop-down list, select the desired software file (.bin).

   If needed, import the software file to be used by clicking “Import“. Locate the software file (.bin or .pkg) and click “Open“.
5. In the Upgrade section and Activate new software section, select when the software shall be upgraded and activated on the handset, respectively.
6. Click “OK“.

Tip: It is also possible to upgrade several handsets of the same device type simultaneously using the Baseline function in the WSG. See Administration Manual for Wireless Service Gateway.

5.1.6 Recapture the Earlier Software

The handset stores two software versions which makes it possible to force the handset to jump back to the earlier software. This feature shall be used if the current software does not work properly.

NOTE: The handset must be switched off to be able to load the earlier software.

Press and hold the keys “7” and “8” and press On/Off key at the same time. The handset loads the earlier software and will keep it as long it is not restarted.

5.1.7 Upgrade Handset Functionality using License

It is possible to upgrade a handset by downloading a license. The following license is available:

- WL3 Messenger Upgrade License

There are three alternatives for upgrading a handset:

- Automatic upgrade, see Section 5.1.7, “Automatic license upgrade”, on page 5.
- License upgrade using import/export, see Section 5.1.7, “License upgrade using import/export”, on page 6.
- Manual upgrade, see Section 5.1.7, “Manual license upgrade”, on page 6.

NOTE: A handset can be re-licensed up to 99 times.

Automatic license upgrade

Use this option if the PDM has an Internet connection to the License Server.

1. Open the PDM.
2. Put the handset in the Desktop Programmer (DP1) cradle.

   First time the handset logs on the PDM, the license key will automatically be downloaded to the handset, go to step 4.
3. If the handset has been logged on to the PDM before, no automatic check for licenses will be done. The PDM and License Server must be synchronized as follows;
   - Select the “Licences“ tab.
   - Right-click the handset in the list.
   - Select “Refresh“.

   The license key will now be downloaded to the handset.
4. The handset will be restarted. See also Section 5.1.7, “Upgrade Handset Functionality using License”, on page 5 for viewing the handset’s license option(s).

   If the handset has been updated to a new device type (to WL3 Messenger Upgrade License), both the new device and the old device is displayed in PDM. The old device has to be manually removed.

License upgrade using import/export

Use this option if the PDM has no Internet connection to the License Server. A product information file (.XML) must first be exported from the PDM, and then imported to the License Web.

1. Put the handset in the Desktop Programmer (DP1)cradle.
2. Open the PDM.
   - Select the “Licences“ tab.
   - Right-click the handset(s) in the list.
   - Select “Export“.
   - Save the file on a computer with Internet connection to access the License Web later on.
3. In a web browser, enter the address to the License Web:

   “https://www.xxxxxxxxxx“

   The License Web is used for:

   - Importing the product information file
   - Viewing/Purchasing the license(s) for the handset(s)
   - Downloading the license file containing the license key(s) for the handset(s)

   See the online help on the License Web for information on how to use the License Web.
4. When the license file (.XML) containing the license key(s) has been downloaded from the License Web, select File > Import > Licences in the PDM to import the file.
5. When the file is imported, the license key(s) is downloaded to the handset(s), and the handset will be restarted. See also Section 5.1.7, “Upgrade Handset Functionality using License”, on page 5 for viewing the handset’s license option(s).

   If the handset has been updated to a new device type (to WL3 Messenger Upgrade License), both the new device and the old device are displayed in PDM. The old device has to be manually removed.

Manual license upgrade

Use this option if the serial numbers of the handset cannot be exported to a file due to a PDM is not in use. The serial number(s) must be manually entered in the License Web to get the corresponding license key for the handset. The license key must also be manually entered in the handset. See the online help on the License Web for information on how to get a license key.

Tip: If several handsets shall be upgraded, it is recommended to use Section 5.1.7, “License upgrade using import/export”, on page 6.

The license key is added via the Admin menu in the handset, see Section 9.1, “Admin Menu Tree”, on page 1 for information on how to activate the Admin menu.

Tip: It is also possible to press *#35# in idle mode for quick access to the “Enter license key“ menu.

1. Press the soft key “Menu“.
2. Select “Calls“.
3. Select “Admin menu“.
4. Select “Enter license key“.
5. Enter license key without blanks.
6. Press “OK“.

If the license key is valid, a dialog window “License key accepted“ is shown. The handset will now be restarted.

If the handset has been updated to a new device type (to WL3 Messenger Upgrade License), both the new device and the old device are displayed in PDM. The old device has to be manually removed.

Move License

It is possible to move a product license (WL3 Messenger Upgrade License) to an unlicensed handset. Any optional licenses will follow. For example, aWL3 Messenger Upgrade license can be moved from a handset with a broken display to an unlicensed handset. The broken handsetcan then be sent for repair.

Prerequisites: A PDM that supports the move license function, and a connection to the license server.

To move a license using the PDM:

1. Put the licensed handset in the desktop programmer.
2. On the Licenses tab, select the handset online.
3. On the License menu, click “Move license...”.
4. In the Move license dialog, select the unlicensed handset and click “OK”.

   The handset in the desktop programmer is restarted.
5. Put the unlicensed handset in the desktop programmer.
6. On the Licenses tab, select the handset online.
7. On the License menu, click “Refresh”.

The handset in the desktop programmer is restarted.

5.1.8 Perform a Factory reset

When a factory reset is done on a handset, all configuration settings will be restored to default values; PBX subscriptions, contacts, messages, downloaded language, certificate etc. will be removed. The software and licenseswill be left intact.

Factory Reset using PDM

1. Open the PDM.
2. Put the handset in the Desktop Programmer (DP1) cradle.
3. In the Device tab, mark the handset to be factory reset. Note that the handset must be online.
4. In the Device menu, select “Factory reset“. Alternatively, right-click the handset and select “Factory reset“.
5. A Reset devices window appears, click “Yes“. The handset will be restarted.

Factory Reset using Handset

It is possible to factory reset a handset from its Admin menu.

1. To activate the Admin menu, select Menu > Settings and enter 40022.
2. Select “Factory Reset“.
3. A Reset portable? window appears, press “Yes“. The handset will be restarted.

5.2 Replacement of Handsets

A handset can be replaced with a spare handset if it is broken. The handset registered in PDM or WSG, is associated with its device type, device ID and extension. During the replacement procedure, the broken handset’s device type and extension will be associated with the spare handset’s device ID.

5.2.1 Replacement Procedure Choice

- If you have WSG and already have applied the network template to the spare handset(s) to log on it later on, see Section 5.2.2, “Replacement of Handset with WSG”, on page 9.

- If you have both PDM and WSG, and need to apply the network template to the spare handset(s) to log on it later on, see Section 5.2.3, “Replacement of the Handset with PDM and WSG”, on page 11.
- If you only have PDM, see Section 5.2.4, “Replacement of Handset with PDM Only”, on page 13.

Data included in a replacement transfer

The following data is replaced during a replacement:

- User parameters
- Contacts (entered by the user)

Note that the following data is not replaced:

- Call list
- Messages
- Company phonebook
- Downloaded language
- Certificates
- Licenses[1]

5.2.2 Replacement of Handset with WSG

There are two different replacement procedures as follows:

- If the broken handset and the spare handset have the same device type and functionality license, seeSection 5.2.2, “Replace without Move Licenses in WSG”, on page 9.
- If the broken handset and the spare handset have not the same device type and/or functionality license. The license must be moved to the spare handset, see Section 5.2.2, “Replace and Move Licenses in WSG”, on page 10.

Replace without Move Licenses in WSG

Both the broken handset and the spare handset must be of the same device type and have same functionality license.

1. In both handsets, press *#34# in idle mode and select “License“ to check that they have same device type and licenses.

   If the login screen is displayed in the spare handset, press “Info“ and select “License“.

1. A handset’s license(s) can be moved to an unlicensed handset (WSG) if following the replacement instructions in Section 5.2.2, “Replace and Move Licenses in WSG”, on page 10.

2. If the broken handset is online in the Device Manager, switch off the handset to make it offline.
3. Take a spare handset prepared with the network settings (including the IP-address to the WSG).
4. Enter the Number and leave the password blank. Press “Login“.

The spare handset is automatically updated from the WSG and might be restarted depending on the changed settings. The last stored settings for the broken handset in the WSG has been transferred to the spare handset.

Replace and Move Licenses in WSG

The broken handset and the spare handset do not have the same device type and/or have the same functionality license.

In order to move the licenses to the spare handset, it must be an unlicensed WL3. To check that the handset is unlicensed, press *#34# in idle mode and select “License“. Only WL3 must be displayed here.

1. Make sure that the broken handset is saved in the Device Manager (indicated by a ✓ in the Saved column. If not, in the Numbers tab, right-click the broken handset and select “Save“.
2. Switch off the broken handset to make it offline in the Device Manager.
3. Take an unlicensed spare handset (WL3) prepared with the network settings (including the IP-address to the WSG).
4. Enter the number and leave the password blank. Press “Login”. The handset is now online in the Device Manager.
5. Make sure that the spare handset is saved in the Device Manager (indicated by a ✓ in the Saved column. If not, in the Numbers tab, right-click the spare handset and select “Save“.
6. Switch off the spare handset to make it offline in the Device Manager.
7. Switch on the broken handset to make it online in the Device Manager.
8. In the Device Manager, select the “Licenses“ tab.
9. Right-click the broken handset and select “Move license...“.
10. In the Move license window, select the WL3 that should receive the license. Press “OK“.
11. The broken handset restarts and has now become a WL3. Switch off the broken handset to make it offline in the Device Manager.
12. Switch on the spare handset to make it online in the Device Manager.
13. In the Device Manager, select the “Licenses“ tab. Right-click the spare handset and select “Refresh“.

The spare handset is automatically updated from the WSG and restarted. The last stored settings and licenses for the broken handset in the WSG has been transferred to the spare handset.

5.2.3 Replacement of the Handset with PDM and WSG

If the spare handset to be used must be factory reset or no network template has been applied, a PDM is needed to apply the network template to the spare handset. When the network template is added, the handset can log on to the Device Manager.

There are two different replacement procedures as follows:

- If the broken handset and the spare handset have the same device type and functionality license, seeSection 5.2.3, “Replace without Move Licenses using PDM and WSG”, on page 11.
- If the broken handset and the spare handset have not the same device type and/or functionality license. The license must be moved to the spare handset, see Section 5.2.3, “Replace and Move License using PDM and WSG”, on page 12.

Replace without Move Licenses using PDM and WSG

Both the broken handset and the spare handset must be of the same device type and have same functionality license.

1. In the handset, press *#34# in idle mode and select “License“ to check that both handsets have same device type and licenses.
2. Make sure that the broken handset is saved in the Device Manager (indicated by a ✓ in the Saved column. If not, in the Numbers tab, right-click the broken handset and select “Save“.
3. Switch off the broken handset to make it offline.

If the spare handset is not prepared with the basic network settings, also perform the steps 4 - 7.

4. Open the PDM.
5. Put the spare handset in the Desktop Programmer (DP1) cradle.
6. Run the template with the basic network settings containing (see Section 4.4, “Configure a Handset with a Template”, on page 7):
   - Network settings[1] (located under Network > Network A, B, C, or D)
   - VoIP settings[2] (located under VoIP)

1. All required system settings for the WLAN. For example SSID and Security mode.
2. VoIP protocol, Gatekeeper IP address or SIP Proxy IP address used to access the PBX.

- WSG settings[1] (located under Device > WSG)

7. Remove the handset from the Desktop Programmer (DP1) cradle. The handset might be restarted depending on parameter changes.
8. Enter the number and the password[2] (if any). Press “Login”.

The spare handset is automatically updated from the WSG and might be restarted depending on the parameter changes. The last stored settings for the broken handset in the WSG has been transferred to the new handset.

Replace and Move License using PDM and WSG

The broken handset and the spare handset do not have the same device type and/or have the same functionality license.

In order to move the licenses to the spare handset, it must be an unlicensed WL3. To check that the handset is unlicensed, press *#34# in idle mode and select “License“. Only WL3 must be displayed here.

1. Make sure that the broken handset is saved in the Device Manager (indicated by a ✓ in the Saved column. If not, in the Numbers tab, right-click the broken handset and select “Save“.
2. Switch off the broken handset to make it offline.
3. Open the PDM.
4. Put the unlicensed spare handset (WL3) in the Desktop Programmer (DP1) cradle.
5. Run the template with the basic network settings containing (see Section 4.4, “Configure a Handset with a Template”, on page 7):
   - Network settings[1] (located under Network > Network A, B, C, or D)
   - VoIP settings[2] (located under VoIP)
   - WSG settings[3] (located under Device > WSG)
6. Remove the handset from the Desktop Programmer (DP1) cradle. The handset is restarted.
7. Enter the number and the password[3] (if any). Press “Login”.
8. Make sure that the spare handset is saved in the Device Manager (indicated by a ✓ in the Saved column. If not, in the Numbers tab, right-click the spare handset and select “Save“.
9. Switch off the spare handset to make it offline.
10. Switch on the broken handset to make it online.

1. IP address and password (if any) to the WSG.
2. The password is only required if the “Password“ parameter is set.

11. In the Device Manager, select the “Licenses“ tab.
12. Right-click the broken handset and select “Move license...“.
13. In the Move license window, select the WL3 that should receive the license. Press “OK“.
14. The broken handset restarts and has now become a WL3. Switch off the broken handset to make it offline in the Device Manager.
15. Switch on the spare handset to make it online in the Device Manager.
16. In the Device Manager, select the “Licenses“ tab. Right-click the spare handset and select “Refresh“.

The spare handset is automatically updated from the WSGand restarted. The last stored settings and licenses for the broken handset in the WSG has been transferred to the spare handset.

5.2.4 Replacement of Handset with PDM Only

Replacement via PDM is used in small VoWiFi systems or when WSG is not available.

- If the broken handset and the spare handset have the same device type and functionality license, seeSection 5.2.4, “Replace without Move Licenses using PDM”, on page 13.
- If the broken handset and the spare handset have not the same device type and/or functionality license. The license must be moved to the spare handset, see Section 5.2.4, “Replace and Move Licenses using PDM”, on page 14.

Replace without Move Licenses using PDM

Both the broken handset and the spare handset must be of the same device type and have same functionality license.

1. In both handset, press *#34# in idle mode and select “License“ to check that they have same device type and licenses.

   Alternatively, if the spare handset has been factory reset, press “Info“ and select “License“.
2. Put the broken handset in the Desktop Programmer (DP1) cradle.
3. Open the PDM.
4. Make sure that the handset is saved in the PDM. In the Numbers tab, a saved handset has the symbol ✓ in the Saved column. If not, right-click the handset and select “Save“ in order to transfer the settings to the spare handset later on.

5. If the spare handset has been previously used, perform a factory reset, see Section 5.1.8, “Perform a Factory reset”, on page 8.
6. Put the spare handset in the Desktop Programmer (DP1) cradle.
7. A Found Device Wizard window appears. Select “Associate with Number“ and click “Next >“.
8. In the list, select the broken handset to be replaced with the spare handset. Click “OK“.

The broken handset has been replaced and its settings have been transferred to the spare handset.

Replace and Move Licenses using PDM

The broken handset and the spare handset do not have the same device type and/or have the same functionality license.

In order to move the licenses to the spare handset, it must be an unlicensed WL3. To check that the handset is unlicensed, press *#34# in idle mode and select “License“. Only WL3 must be displayed here.

1. Put the broken handset in the Desktop Programmer (DP1) cradle.
2. Open the PDM.
3. Make sure that the broken handset is saved in the PDM. In the Numbers tab, a saved handset has the symbol ✓ in the Saved column. If not, right-click the handset and select “Save“ in order to transfer the settings to the spare handset later on.

1. Put an unlicensed spare handset () in the Desktop Programmer (DP1) cradle.
2. Run the template with the basic network settings containing (see Section 4.4, “Configure a Handset with a Template”, on page 7):
   - Network settings[1] (located under Network > Network A, B, C, or D)
   - VoIP settings[2] (located under VoIP)

   The handset might be restarted depending on parameter changes.
3. Put the broken handset in the Desktop Programmer (DP1) cradle.
4. In the PDM, select the “Licenses“ tab.
5. Right-click the broken handset and select “Move license...“.
6. In the Move license window, select the WL3 that should receive the license. Press “OK“. The broken handset restarts and has now become a WL3.
7. Put the spare handset in the Desktop Programmer (DP1) cradle.

1. All required system settings for the WLAN. For example SSID and Security mode.
2. VoIP protocol, Gatekeeper IP address or SIP Proxy IP address used to access the PBX.

8. In the PDM, select the “Licenses“ tab. Right-click the spare handset and select “Refresh“.

   The spare handset is restarted and the licenses for the broken handset in the PDM has been transferred to the spare handset.

9. A Found Device Wizard window appears. Select “Associate with Number“ and click “Next >“.

10. In the list, select the broken handset to be replaced with the spare handset. Click “OK“.

    The spare handset might be restarted and the settings for the broken handset in the PDM has been transferred to the spare handset.

5.3 Change Number of a Handset

It is possible to change the number of a handset, but keep all other settings in the handset.

1. Open PDMor the Device ManagerWSG.
2. Open the Numbers tab, and select the handset to be updated with a new number.
3. In the Number menu, select “Rename...“. Alternatively, right-click the handset and select “Rename...” from the menu that appears.
4. In the New prefix field, enter the new prefix (if needed).
5. In the New number field, enter the new number.

NOTE: Make sure that the new number does not exist in another system. If several handsets have the same number, their settings will overwrite each other when synchronizing with WSG/PDM.

---

6. Click “OK“.

The new number will be synchronized with the handset when it is connected to PDM or WSG.

5.4 Update Parameters via WSG

This section describes the general procedure on how to change/update parameters using the WSG. The update starts when the handset is idle and will not interrupt an ongoing call.

NOTE: Only select the parameters that are changed, if all parameters are selected, the system performance decreases.

---

1. Open the WSG.
2. Create a new template with only the parameters that shall be changed.
3. Select the numbers that should be updated and apply the template.

   The handsets are automatically updated from the WSGand might be restarted depending of which parameters that are changed.

5.5 Perform a Security Upgrade via WSG

This section describes how to perform an update/change of the WLAN password/ authentication using the WSG.

NOTE: Change settings in the handset before change settings in the AP. Else, synchronization of new settings to the handset settings cannot be performed.

Tip: Leave one access point with the old configuration to allow switched off handsets to receive the updates when they are turned on. Bring the handset to that APs coverage area.

1. Open the WSG.
2. Create a new template with the new security settings.
   - Security mode[1]
3. Apply the new template to the handsets.

   The handsets are automatically updated from the WSG and restarted.

NOTE: At this time, the handsets have no access to the WLAN system.

---

4. Change the security settings for the access points.

1. All required settings for the WLAN. For example User name, Password, Regulatory domain etc.

The handsets are now able to access the WLAN.

5.6 Upgrade the Template

The upgrade procedure of the templates definition version is described in the Administration Manual for the Portable Device Manager.

5.7 Create a Configuration Backup

It is recommended to have a backup of the configuration in the handsets and the site.

The backup procedure is described in the Administration Manual for the Wireless Service Gateway.

6 Handset Configuration

NOTE: This chapter describes settings in parameter definition files (.def). These files are regularly updated and settings may change slightly. For example "On" to "Enable" or a parameter can be moved to another directory.

The handset requires some settings to function in the VoWiFi system. All settings are done in the PDMWSG. This section describes the available settings for the handset. The first part explains network settings and the second handset settings.

For more information, see the PDM Online Help that is accessible for each parameter by clicking the icon in the Edit parameters view, or the Administration Manual for the Personal Device Manager.

NOTE: Configuring OpenStage WL3 Device to be used at OpenScape Voice (OSV) see Appendix B in this Manual.

6.1 Select Network

The handset can switch between four different WLAN system configurations called Network A, Network B, Network C, and Network D. The name can be changed (via PDM or WSG) and is visible in the handset, see Section 6.1.2, “Change Name of Network”, on page 2.
A handset can be configured for up to four different WLANs but only for oneWSG and one VoIP System.

The configured networks in PDM must have a SSID value in order to view them in the handset.

Network A is the default system and used throughout this manual.

1. Select Network > General.
2. In the Active network drop-down list, select “Network A”.

6.1.1 Change Active Network

1. Select Network > General.
2. In the Active network drop-down list, select “Network A“, “Network B“, “Network C“, or “Network D“.

6.1.2 Change Name of Network

The name is shown when selecting network in the handset.

1. Select Network > Network A (or B, C, or D).
2. In the Network name field, enter the name of the network.

6.1.3 Enable Switch between Networks

The handset may be configured to switch between networks on the site.

1. Find parameter Network > General > Auto-switch network, and select “Enable”.
   Parameter Auto-switch network time-out appears. This parameter defines the time before the handset tries to connect with the next included network.
2. Enter a value in seconds for parameter Auto-switch network time-out.
3. For the networks that should be included in the auto-switch network:
   Find parameter Network > Network A (B, C, D) > Include in auto-switch network, and select “Yes” to enable switch to Network A (B, C, D).

6.2 IP Address Settings

The IP address settings can be configured in two ways.

- The handset can configured to receive an IP address automatically from a DHCP server, see Section 6.2.1, “Automatic IP Address Settings”, on page 2.
- If no DHCP server is used, a unique IP address must be entered manually for each handset, see Section 6.2.2, “Static IP Address (Manual) Settings”, on page 3.

6.2.1 Automatic IP Address Settings

1. Select Network > Network A (or B, C, D).
2. In the DHCP mode drop-down list, select “Enable”.

The Phone IP address, Subnet mask and Default gateway are automatically set up.

6.2.2 Static IP Address (Manual) Settings

1. Select Network > Network A (or B, C, D).
2. In the DHCP mode drop-down list, select “Disable (static mode)”. Additional parameters will be displayed.
3. In the Phone IP address field, enter the unique IP address for the handset.
4. In the Subnet mask field, enter the subnet mask.
5. In the Default gateway field, enter the IP address for the default gateway.

DNS Server Settings

It is possible to configure which DNS server the handset shall use. If the primary DNS server is available, it is always used. Otherwise, the secondary DNS server will be used.

NOTE: The DNS parameters are only visible if the DHCP mode is set to “Disable (static mode)”, see Section 6.2.2, “Static IP Address (Manual) Settings”, on page 3.

Primary DNS Server

1. Select Network > Network A (B, C, or D).
2. In the Primary DNS field, enter the IP address to the primary DNS server.

Secondary DNS Server

1. Select Network > Network A (B, C, or D).
2. In the Secondary DNS field, enter the IP address to the secondary DNS server.

6.3 Network Settings

6.3.1 SSID

The SSID is the name of the network the handset associates to.

1. Select Network > Network A (B, C, or D).
2. In the SSID field, enter system SSID.
   Note that the SSID is case-sensitive.

6.3.2 Voice Power Save Mode

The voice power save mode is used during calls. NONE is recommended to obtain optimal voice quality. U-APSD uses less power but is more sensitive to network disturbances.

If supported by the infrastructure U-APSD is the preferred choice and multiple the talk time more than 4 times compared to NONE mode.

1. Select Network > Network A (B, C, or D).
2. In the Voice power save mode drop-down list, select one of following:
   - NONE
   - U-APSD

6.3.3 World Mode Regulatory Domain

There is a set of regional rules for the world mode settings and the a-band that the handset complies to. The preferred and the default setting is “World mode (802.11d)”. The handset gets its regulatory settings from the AP. If this is not supported by the AP, then this has to be set in the handset as follows:

1. Select Network > Network A (B, C, or D).
2. In the World mode regulatory domain drop-down list, select one of the following:
   - World mode (802.11d) (default)
   - ETSI
   - Japan
   - USA

6.3.4 Radio and Channel Selection

The handset supports the 802.11a/n radio and 802.11b/g/n radio, but it cannot use the 802.11a/n radio and the 802.11b/g/n radio simultaneously. The radio determines which channels that can be used.

802.11 a/n Channels

Defines which 802.11a/n channels to use. It is recommended to use the value “UNII-1“. Select “Advanced“ only if the channels shall be set in the Advanced: 802.11 channels parameter, see Section 6.3.4, “Advanced: 802.11 Channels”, on page 6.

1. Select Network > Network A (B, C, or D).
2. In the 802.11 protocol drop-down list, select “802.11a/n“.
3. In the 802.11a/n channels drop-down list, select one of the following:

NOTE: The selected World Mode Regulatory Domain determines which channels to be used. SeeSection 6.3.4, “Bands and Channels used by WiFi a-radio”, on page 5.

- All
- Non DFS
- UNII-1
- UNII-3
- UNII-1, UNII-2
- UNII-1, UNII-2, UNII-3
- UNII-1, UNII-2, UNII-2 Extended
- Advanced

Bands and Channels used by WiFi a-radio

	Frequency band	Channels
Non DFS	5.150 - 5.250 MHz, 5.725 - 5.845 MHz	36,40,44,48 149,153,157,161, 165
UNII-1	5.150 - 5.250 MHz	36,40,44,48
UNII-2	5.250 - 5.350 MHz	52,56,60,64
UNII-2 Extended	5.470 - 5.725 MHz	100, 104, 108, 112,116, 120, 124, 128, 132, 126, 140
UNII-3	5.825 - 5.835 MHz	149,153,157,161

Table 1

802.11 b/g/n Channels

Defines which 802.11b/g/n channels to use. It is recommended to use the default value “1,6,11“. If set to “All”, all channels are scanned for access points which decreases the WLAN performance. Select “Advanced“ only if the channels shall be set in the parameter Advanced: 802.11 channels.

1. Select Network > Network A (B, C, or D).
2. In the 802.11 protocol drop-down list, select “802.11b/g/n“.
3. In the 802.11b/g/n channels drop-down list, select one of the following:

- All
- 1,6,11
- Advanced

Advanced: 802.11 Channels

Defines which 802.11 channels to use. Only used if the parameter in the 802.11b/g/n channels, or 802.11a/n channels is set to “Advanced“.

NOTE: It is not possible to scan channels in 802.11b/g/n and 802.11a/n simultaneously.

---

1. Select Network > Network A (B, C, or D).
2. Enter channels to scan in a comma-separated list, for example 1,6,11 (the order has no impact; 11,6,1 will give the same result).

6.3.5 Transmission Power

This is the transmission power the handset will use when transmitting data to the WLAN system. If “Automatic” (default) is used, the transmission power is adapted according to 802.11h, CCX or maximum possible.

1. Select Network > Network A (B, C, or D).
2. In the Transmission power drop-down list, select one of the following:
   - Automatic
   - 0 dBm
   - 5 dBm
   - 11 dBm
   - 14 dBm
   - 20 dBm (max)

6.3.6 IP DSCP for Voice/Signaling

Differentiated Services Code Point (DSCP) defines which value to use for outgoing voice and signaling traffic. The DSCP value is used for QoS on the LAN. The settings in the handset must agree with the settings in the system, otherwise it will result in bad voice quality.

1. Select Network > Network A (B, C, or D).
2. In the IP DSCP for voice and/or IP DSCP for signaling drop-down list, select one of the following:
   - 0x38 (56) - Class selector 7
   - 0x30 (48) - Class selector 6
   - 0x2E (46) - Expedited Forwarding (default for voice)
   - 0x28 (40) - Class selector 5
   - 0x20 (32) - Class selector 4
   - 0x1A (26) - Assured forwarding 31 (default for signaling)
   - 0x18 (24) - Class selector 3
   - 0x10 (16) - Class selector 2
   - 0x08 (8) - Class selector 1
   - 0x00 (0) - Default

6.4 Security Settings

The WLAN system can be configured to use various encryption and/or authentication schemes. The use of extensive encryption/authentication schemes can cause incidents of dropped speech during handover due to the time to process the authentication.

6.4.1 Open

Select Open if no encryption/authentication is required. To select Open as the security mode, do the following:

1. Select Network > Network A (B, C, or D).
2. In the Security mode drop-down list, select “Open”.

6.4.2 WEP 64/128-bit Key

To select WEP64/128-bit Key as the security mode. Do the following:

1. Select Network > Network A (B, C, or D).
2. In the Security mode drop-down list, select “WEP64/128-bit Key”. Additional parameters can now be set. See below.

3. In the WEP key 1 field, enter the WEP key to be used.
4. In the WEP transmit key drop-down list, select “WEP key 1“.

6.4.3 WPA-PSK & WPA2-PSK

To select WPA-PSK & WPA2-PSK as the security mode. Do the following:

1. Select Network > Network A (B, C, or D).
2. In the Security mode drop-down list, select “WPA-PSK & WPA2-PSK”.
3. In the WPA-PSK passphrase field, enter the passphrase for WPA-PSK/& WPA2-PSK.

6.4.4 802.1X with EAP-FAST

To select EAP-FAST as the authentication method. Do the following:

1. Select Network > Network A (B, C, or D).
2. In the Security mode drop-down list., select “EAP-FAST”.
3. In the EAP authentication user name field, enter the user name for EAP authentication.
4. In the EAP authentication password field, enter the password for EAP authentication.

6.4.5 802.1X with PEAP-MSCHAPv2

Select PEAP-MSCHAPv2 if root certificate is to be used for authentication. To select PEAP-MSCHAPv2 as the authentication method. Do the following:

1. Ensure that the handset is online in PDM.
2. Import the root certificate by do the following:
   - In the Numbers tab, right-click the handset’s number and select “Edit certificates“. An Edit certificate window opens.
   - In the Root tab, click “Edit“ and select the root certificates to import. Click “Close“.
3. Select Network > Network A (B, C, or D)
4. In the Security mode drop-down list, select “PEAP-MSCHAPv2”.

5. In the EAP authentication user name field, enter the user name for EAP authentication.
6. In the EAP authentication password field, enter the password for EAP authentication.

6.4.6 EAP-TLS

Select EAP-TLS if a client certificate is to be used for authentication. To select EAP-TLS as the authentication method, do the following:

1. Ensure that the handset is online in PDM.
2. Import the certificate by do the following:
   - In the Numbers tab, right-click the handset's number and select "Edit certificates". An Edit certificate window opens.
   - In the Root tab and Client tab, click "Edit" and select the certificates to import. Click "Close".
3. Select Network > Network A (B, C, or D).
4. In the Security mode drop-down list, select "EAP-TLS".
5. In the EAP client certificate drop-down list, select the client certificate to use.

6.5 Handset Settings

This section describes specific settings for the handset that can be changed using the keypad on the handset, and/or can be set in the PDM/WSG to assist the user or to set the initial value when the handset is commissioned.

General Settings	**Keypad***	**PDM**
Section 6.5.1, "Automatic key lock", on page 10	x	x
Section 6.5.2, "Phone lock", on page 11	x	x
Section 6.5.4, "Headset type", on page 12	x	x
Section 6.5.3, "Audio adjustment", on page 11	x**	x
Section 6.5.12, "Short cuts", on page 16	x	x
Section 6.5.6, "Configure Profiles", on page 13	x	x
Section 6.5.8, "Battery Warning", on page 15	x	x
Section 6.5.5, "In Charger Behavior", on page 13	x**	x
Section 6.5.9, "Shared Phone", on page 15		x
Telephony		
Section 6.9.8, "Message Centre Number", on page 33		x

Table 2

Section 6.9.9, “Max number of Call Completions”, on page 33		x
Section 6.9.10, “Dial Pause Time”, on page 33		x
Section 6.9.11, “Direct off Hook from Charger”, on page 33	x	x
Section 6.9.12, “Replace Call Rejected with User Busy”, on page 34		x
Section 6.9.6, “Emergency Number”, on page 32		x
Section 6.5.14, “Import Contacts”, on page 19		x
Section 6.5.15, “Company Phonebook”, on page 19		x
Section 6.5.16, “Central Phonebook”, on page 20		x
Section 6.9.7, “Voice Mail Number”, on page 32		x
Regional Settings		
Section 6.10.1, “Set Time & Date”, on page 34	x	x
Section 6.5.11, “Select Default Language”, on page 16	x	x
Section 6.10.3, “Dialing Tone Pattern”, on page 35		x
Customize Menu		
Section 6.5.10, “Uploadable Language”, on page 16		x
Section 6.12.1, “Hide Menu Items”, on page 37		x
Section 6.12.2, “Services”, on page 37	x	x
Display		
Section 6.11.1, “User Display Text”, on page 35	x	x
Section 6.11.3, “Font style”, on page 36	x	x
Section 6.11.4, “Backlight Timeout”, on page 36		x
Section 6.11.5, “Brightness”, on page 36	x	x
Section 6.11.6, “Screen Saver”, on page 36	x	x
Messaging		
Section 6.7, “Messaging Settings”, on page 20	x**	x
Alarm		
Section 6.8, “Alarm Settings”, on page 26		x

Table 2

* Refer to the User Manual for more information on how the user can change the settings via the handset’s keypad

** Some parameters cannot be changed via the keypad.

6.5.1 Automatic key lock

1. If configured, it is possible to dial a pre-defined emergency number when the keypad is locked, see Section 6.9.6, “Emergency Number”, on page 32.Select Device > Settings.
2. In the Automatic key lock drop-down list, select one of the following:

- Enable - activates automatic key lock.
- Disable - deactivates automatic key lock

6.5.2 Phone lock

Activate the phone lock to prevent unauthorized usage of the handset. A password is required to unlock the handset in order to access its functions.

NOTE: If configured, it is possible to dial a pre-defined emergency number when the handset is locked, see Section 6.9.6, “Emergency Number”, on page 32. It is not recommended to use Phone Lock when using the Shared Phone feature, see Section 6.5.9, “Shared Phone”, on page 15

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1. Select Device > Settings.
2. In the Phone lock drop-down list, select one of the following:
   - On - the handset will be locked after a few seconds when it is not used.
   - On in charger - the handset will be locked when placed in charger.
   - Off - the phone lock is disabled.

6.5.3 Audio adjustment

Select the volumes for the different audio signals in the handset.

1. Select Audio > Volume.
2. Select the applicable volumes item in the drop-down lists:
   - Handsfree volume
   - Headset volume
   - Speaker volume
3. In the Persistent volume drop-down list, select “Enable” to automatically store volume changes in the handset for future calls.

The parameter affects the “Normal”, “Headset“, “Loudspeaking“ mode.

For selection of headset, see Section 6.5.4, “Headset type”, on page 12.

NOTE: Changing this parameter may result in lower sound quality and high sound level. Evaluate carefully before applying.

6.5.4 Headset Configuration

Headset type

Select the headset model that is used.

1. Select Headset > General.
2. Select the applicable item in the drop-down list:

NOTE: Do not select “Hearing protection” unless a Peltor headset is used.

- Hearing protection
- Mic on boom
- Mic on cable
- User model (If not any headset is used above, this option can be used to configure an own headset profile. If selected, additional configuration is required, seeSection 6.5.4, “Headset user model”, on page 12)

Headset user model

These settings are required if User model is selected under Headset > General.

1. Select Headset > User model.
2. In the Name of headset field, enter a descriptive name. For example the headset model to be used.
3. In the following drop-down lists, select the applicable values for the headset:
   - Microphone gain
   - Speaker gain
   - Side tone

NOTE: Changing the parameters may result in lower sound quality and high sound level. Evaluate carefully before applying.

Corded headset button

1. Select Headset > General.
2. In the Call with headset button list, select one of the following:
   - Not activated – it is only possible to answer/end a call.
   - Last called number – the last called number will be dialled.

- Predefined number – a predefined number will be called (if selected, continue with step 3)

3. If needed, in the Predefined number field, enter the number to be dialled when the headset button is pressed.

6.5.5 In Charger Behavior

The handset behavior when placed in a charger can be configured.

In charger action

1. Select Device > Settings.
2. In the In charger action drop-down list, select one of the following:
   - No action - no action will be performed when handset is placed in charger
   - Switch off - the handset will be switched off when placed in charger
   - Sound off - the handset will be silenced when placed in charger.
   - Change profile (WL3 Plus only) the handset will change profile when placed in charger.
     - In the Change profile in charger drop-down list, select the profile to be used.
     - If needed, configure the selected profile, see Section 6.5.6, “Configure Profiles”, on page 13.

Clear lists in charger

1. Select Device > General.
2. In the Clear lists in charger drop-down list, select one of the following:
   - On - message lists and call lists will be deleted when handset placed in charger
   - Off - no action will be performed when handset placed in charger.

6.5.6 Configure Profiles

It is possible to set up an own profile for incoming calls, message alerts,vibrating alerts, key sound etc. This can be useful when there are many users on the same handset, and they want different sound profiles. It can also be used for temporary settings, for example while in a meeting, incoming calls should be silent.

Profiles are configured via parameters in the “Profiles“ folder.

1. Select “Profiles“.
2. Select “Normal“ or “Profile X“ (where X represents 1- 4)
3. The following settings for the profile can configured:
   - Profile name
   - Internal/External/Callback ring signal
   - Ring volume
   - Vibrator
   - Key sound
   - Message alert signalAnswering settings
   - Diversion settings

Diversions

Calls can be diverted to other phone numbers, for example when busy.

1. In the applicable profile, select Diversions.
2. Activate a diversion by selecting “Enable” in the applicable diversion drop-down lists. The following diversions are possible:
   - Activate diversions for all calls
   - Activate diversions on user busy
   - Activate no answer diversions
3. Enter the diversion number in the applicable diversion number text field.
4. If the handset is configured to access the PBX via SIP protocol, the handset can be configured to manage the diversion locally instead of using the PBX. Requires that the handset is within the coverage area and is switched on. Select VoIP > SIP. In the Call forward locally drop-down list, select “Enable“.

6.5.7 Hide Missed Call Window

A missed call is by default indicated by a Missed call window. It is possible to hide this window, for example, if both a handset and a mobile is used. If the user answers the call using the mobile, the Missed call window will not be displayed in the handset.

1. Select Device > Call.
2. In the Show missed calls popup drop-down list, select “No” to hide the Missed call window.

6.5.8 Battery Warning

1. Select Device > Settings
2. In the Battery warning drop-down list, select one of the following:
   - Sound repeatedly
   - Sound once
   - Sound off

6.5.9 Shared Phone

This setting defines if the handset is personal or shared. The default setting is “No” but if “Yes” is selected, the handset can be used by several users. Each user can still have their individual settings and access them by personal login and a password (the password can be a common password for all users or the call number). In order to use the Shared phone functionality, the following is required:

- The handset does not use certificate.
- WSG

A handset that is personal may also use a shared password (empty or specific) from the WSG.

NOTE: If you accidentally enter a personal phone number in the shared handset, the handset becomes personal and cannot be used as a shared phone any longer. The handset must be configured to a shared phone again.

---

1. Select Device > General.
2. In the Phone mode drop-down list, select one of the following:
   - Personal
   - Shared

NOTE: When the setting has been changed the handset is automatically restarted.

6.5.10 Uploadable Language

It is possible to upload one additional language to the handset. The language file is generated via an Excel file. The Excel file used to generate language files is delivered from your supplier.

Tip: It is also possible to upload a language on several handsets of the same device type simultaneously using the Baseline function in the Administration Manual for the Wireless Service Gateway.

If another language file is uploaded, the first additional language is overwritten.

Certain special characters are allowed when generating the language file, see information in the Excel file.

To upload an additional language, do as follows:

1. In the Devices tab, select the device(s) to be uploaded with additional language.
2. In the Device menu, select “Upload language...“.
3. If the uploaded language shall be used in the handset, see Section 6.5.11, “Select Default Language”, on page 16 for more information.

6.5.11 Select Default Language

Defines he default operating language for the handset. This setting can later be changed by the user.

1. Select Device > Settings.
2. In the Language drop-down list, select the language to be used.
3. If the downloaded language is selected, it might be needed to select matching characters as text input language, and the sort order in the phonebook.
   In the Input Language drop-down list, select the text input language to be used.

NOTE: This parameter is only applicable for the downloaded language and cannot be changed by the user.

6.5.12 Short cuts

One click access to predefined functions can be configured for the Soft keys, Hot keys, Navigation keys, and the Multifunction button[1]. It is for example possible to define the soft key to make a call.

Configure a Hot Key

A hot key is activated by pressing a preprogrammed button “0”, “2“ - “9” for more than 1 second in idle mode. The function is used, for example, to change profile, send message or make a phone call to a specific number.

1. Select Short cuts > Hot keys X (where X is 0, 2 - 9).
2. Continue withSection 6.5.12, “Additional Short Cut Settings”, on page 17.

Configure Soft Key

1. Select Short cuts > Soft Key X (where X is Left, Middle, or Right)
2. In the Name field, enter the name of the soft key to be displayed in the handset.
3. Continue withSection 6.5.12, “Additional Short Cut Settings”, on page 17.

Configure Navigation Key

1. Select Short cuts > Navigation Key X (where X is Up, Down, Left, or Right)
2. Continue withSection 6.5.12, “Additional Short Cut Settings”, on page 17.

Configure Multifunction Button

1. Select Short cuts > Multifunction button X (where X is Long press or Multi press)
2. Continue withSection 6.5.12, “Additional Short Cut Settings”, on page 17.

Additional Short Cut Settings

1. In the Function drop-down list, select the function to be used:
   - Phone call
   - Phone call “Loudspeaker mode”
   - Call List
   - Contact list
   - Central phonebook (system dependent feature)
   - Message inbox
   - Send a message
   - Change profile (if selecting profile 1-4, the profile must first be configured, see Section 6.5.6, “Configure Profiles”, on page 13.)
   - Open a menu
   - Services (Not applicable for WL3 Messaging)

1. The Multifunction button is applicable for WL3 and WL3 Messenger Upgrade only.

- Logout (applicable for the Shared Phone feature)
- Call diversions
- RSSI measurement

2. In the Value field, enter the applicable value. This is mandatory when using Phone call function.
3. In the Control Question drop-down list, select “Enable“ if the Proceed? window shall be displayed after the key is pressed. This is used to avoid that a function is accessed by mistake.
4. In the Read Only drop-down list, select “True“ if the user shall not be able to change the short cut.

6.5.13 Soft Key Functions During Call

It is possible to access a non-configurable function by pressing the right soft key during a call.

1. Select Device > Call.
2. In the Right in call soft key name field, enter the name of the soft key to be displayed during a call.
3. In the Right in call soft key action drop-down list, select one of the following functions:
   - Conference
   - Contacts
   - Messaging (if applicable)
   - Disabled
   - End Call
   - Hold
   - Loudspeaker
   - New call (put active on hold)
   - Retrieve
   - Switch
   - Transfer (to held call)
   - Transfer to new call (blind transfer)

6.5.14 Import Contacts

It is possible to import a phonebook file (that is, local phonebook) to a handset. The phonebook file is a tab-separated .txt file, and contains two items per row; number and name. The PDM/WSG is used to import the phonebook file to the handset. See Import Contacts in Administration Manual for the Portable Device Manager or the Administration Manual for the Wireless Service Gateway.

6.5.15 Company Phonebook

It is possible to create a phonebook that is administered centrally and uploaded to the handset from PDM/WSG. If this feature is used, entries from Contacts and Company Phonebook are merged. The Company Phonebook entries are locked and cannot be edited in the handset.

The following steps must be performed:

1. Create a Company phonebook file, see Section 6.5.15, “Create a Company Phonebook File”, on page 19.

Import the Company phonebook file to PDM/WSG, see Administration Manual for the Portable Device Manager or the Administration Manual for the Wireless Service Gateway.

Upload the company phonebook file to the handset(s), see Administration Manual for the Portable Device Manager or the Administration Manual for the Wireless Service Gateway.

Create a Company Phonebook File

The company phonebook file (.cpb) is normally created from an Excel file using a script to extract the information and create to the phonebook file (.cpb). The Excel file, “Company Phonebook.xls“ is delivered from your supplier.

The format of the rows in the phonebook file is:

<Name><tab><phone number><carriage return>

followed by additional rows for each entry.

The handset supports a maximum length of 24 characters in each field, additional characters are truncated when the phonebook file is created. The following characters are accepted in the handset number field in the phonebook file, but are ignored when the phonebook file is created: “(“, “)“, “-“ and “ “(space).

6.5.16 Central Phonebook

NOTE: This is a system dependent feature.

If the network is equipped with a messaging server with a phonebook service, the Central Phonebook on that server can be accessed from the handset.

1. Select Device > Message centre.
2. In the Central phonebook field, enter the number to the Central phonebook. The number to be used is set to default 999999. If the system is not equipped with a Central Phonebook, this menu option can be removed from the handset by entering an empty value.

6.6 Messaging and Alarm

The messaging and alarm functions are provided via the WSG and described in the document Administration Manual for the Wireless Service Gateway.

6.6.1 IP Address to the WSG

The WSG handles all communication between the WLAN and its built-in Centralized Device Manager. It is possible to send messages from a web browser to a handset, handle messages to groups, send simple messages from handset to handset (and to groups), search for telephone numbers in a central database (on PC), have a central telephone book on the WSG (not PC-based) and to have absence handling in the system.

1. Select Device > WSG.
2. In the IP address field, enter the IP address of the WSG. If left empty, no messaging or alarm function will be available.

6.7 Messaging Settings

NOTE: Applicable to WL3 MessagingWL3 Plus only.

It is possible to configure how incoming messages shall be indicated and displayed in handset.

Profiles > Normal, Profile 1- 4

- Vibrator
  Determines if the handset shall vibrate when receiving incoming calls and messages.
- Message alert
  Determines the message sound for incoming messages.
- Message volume
  Determines the message volume for incoming messages. By default, the message volume follows the ringer volume, but another message volume can be set with this parameter.

Device > Messaging

- Message list representation
  Can be set to text or number.
- Message text size
- Time to read (TTR)
  Determines if the user needs to close a message manually, or if the message automatically shall be closed when TTR expires. Regardless how a message is closed, it is removed from the message queue and stored in the Messaging Inbox. TTR starts when a message is displayed and keep running also when the message is placed in the messaging queue. If a user presses any key when a message is displayed, the TTR is reset. See also Section 6.7.1, “Examples of TTR/TTP settings”, on page 23.
- Time to prioritize (TTP)
  Determines how long messages shall keep their priority status. The TTP starts when a message is displayed. If a user presses any key when a message is displayed, the TTP is reset. If receiving a message with higher priority than the displayed message, the message with lower priority is placed in queue and its TTP is paused. When the TTP elapsed for a message, it is put last in the queue. See also Section 6.7.1, “Examples of TTR/TTP settings”, on page 23.
- Repeat message indication
  This parameter enables/disables message indications. It sets whether a message indication shall be repeated until confirmed by the user or not. The current repetition rate is 7 seconds. If the message itself contains a repetition, it overrides this setting.
- Vibrator for message during call
  Determines if the handset shall vibrate when receiving messages during an ongoing call.
- IM option mode
  This parameter is used for older applications and sets that three soft keys shall be placed automatically, i.e. on soft keys or in an option menu (list).

- Call priority
  This parameter determines:
  - whether call information presented on the display during incoming, ongoing and outgoing call shall be suppressed when viewing a message
  - whether an ongoing call shall be disconnected when receiving a PTT invitation with Answer mode set to “Automatically”.

  0 = Call indication will override all messages and ongoing call is never disconnected (default).

  1-9 = Comparison with message priority; highest priority will be shown and PTT invitation with higher priority causes disconnection of ongoing call.

  10 = Call indication on the display will always be suppressed and ongoing call will always be disconnected by a PTT invitation.

  The tables below show examples of priority settings and how they affect the handset’s behaviour.

Call prio	**PTT invitation (prio)***	**Disconnection of ongoing call?**
0	1	No, since this call priority setting overrides all PTT invitations regardless of priority.
6	6	No, an ongoing call will not be disconnected when the priority is equal.
2	1	Yes, immediately since the PTT priority is set to 1 and also is higher than Call priority.
3	2	Yes, after 10 seconds since the PTT priority is higher than Call priority.
10	1	Yes, immediately since the PTT priority is set to 1 and also is higher than Call priority.
10	2	Yes, after 10 seconds since the PTT priority is higher than Call priority.

Table 3Call prio vs PTT prio

* PTT invitation received as incoming call has always priority 6, while PTT invitation received as message can have priority 1 - 9 depending on configuration.

Call prio	Displayed Message (prio)	Call information suppressed?
0	1	No, since this call priority setting overrides all messages regardless of priority.
7	6	Yes, since the priority of the displayed message is higher than the incoming call.
6	6	Yes, since the message is considered as most important when the priority is equal.
1	3	No, since the priority of the incoming call is higher than the displayed message.

Table 4Call prio vs Message prio

10	1	Yes, the call information will always be suppress regardless of the message priority.

Table 4Call prio vs Message prio

- Settings > Display
- Rotate display text
  Determines if incoming messages shall be displayed upside down. This can be useful if you wear the handset in a belt and want to read the message without rotating the handset. When pressing any key, the messages will be displayed in the normal way. **Note:** This setting also affects how incoming calls shall be displayed.

6.7.1 Examples of TTR/TTP settings

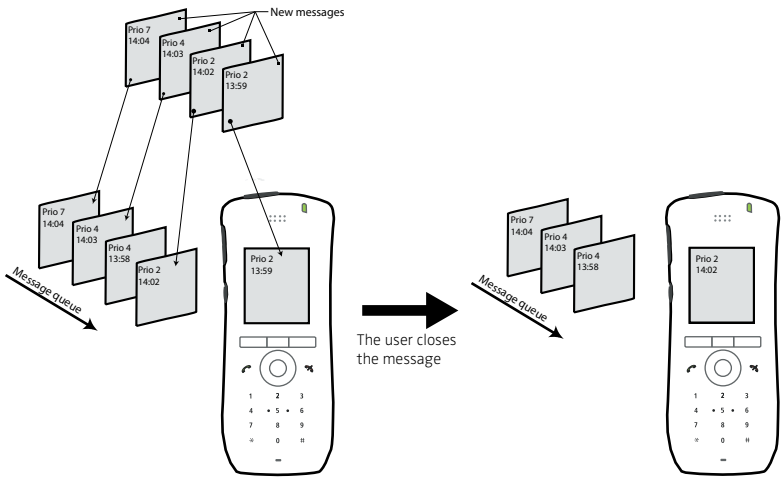
Example 1

This example describes the message handling with the following message settings:

- TTP= Prioritize forever
- TTR= Close manually

Tip: It is recommended to use these settings if messages with the highest priority always shall be displayed until the user closes the current message.

Figure 1 How queuing and prioritizing for messages with equal messages works



In Figure 1, a message with priority 2 is received at 13:59 and is displayed in the handset. Another message with equal priority is received at 14:02 and will be placed in the queue. If no messages with higher priority are received, the user

needs to close the current displayed message to show the next message in the queue. In this case, the message received at 14:02. The closed message will be indicated as a read message in the Messaging Inbox.

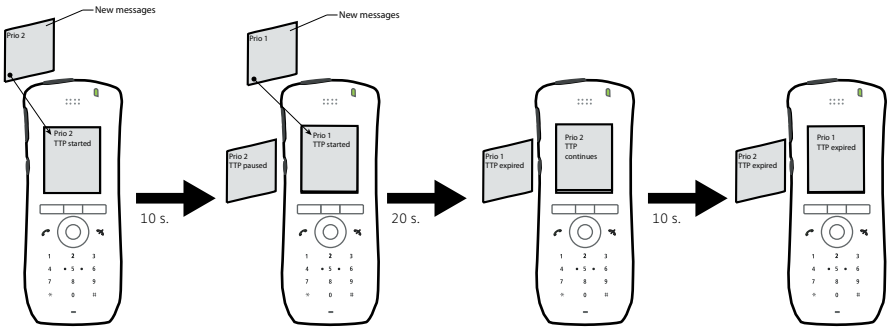
Example 2

This example describes the message handling with the following message settings:

- TTP= 20 seconds
- TTR= Close manually

Tip: It is recommended to use these settings if the user shall not be interrupted during 20 seconds while reading a message, unless a message with higher priority is received. When the user has read a message, its priority is no longer important, that is when TTP expires.

Figure 2



In Figure 2, a message with prio 2 is received and displayed in the handset, TTP for the message is started.

After 10 seconds, a second message with priority 1 is received and displayed while the message with priority 2 is put in the queue. TTP for the message with priority 2 is paused, and TTP for the message with priority 1 is started.

After 20 seconds, TTP expires for the message with prio 1 and the message is placed in the queue. The message with priority 2 is shown again and its TTP continues.

TTP expires after 10 seconds for the message with priority 2. In this case, all messages have been shown 20 seconds each, and the oldest shown message with the highest priority is displayed (in this case, the message with priority 1). The handset does not indicate when it shows the message again, since it already has been shown and indicated once. The message with priority 2 is placed in the queue.

Example 3

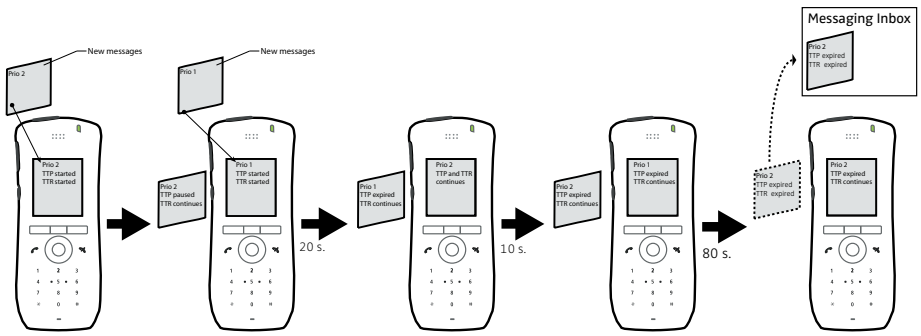
This example describes the message handling with the following message settings:

- TTP= 20 seconds

- TTR= 2 minutes

Tip: It is recommended to use these settings if the user shall not be interrupted during 20 seconds while reading a message, unless a message with higher priority is received. When the user has read a message, its priority is no longer important, that is when TTP expires. In addition, if a message is not shown again within the TTR interval, it is considered as not important and is removed from the queue.

Figure 3 Message handling without manually closing a message.



In Figure 3, a message with prio 2 is received and displayed in the handset, TTP and TTR for the message is started.

After 10 seconds, a second message with priority 1 is received and displayed while the message with priority 2 is put in the queue. TTP for the message with priority 2 is paused, but TTR continues. TTP and TTR for the message with priority 1 is started.

After 20 seconds, TTP expires but TTR continues for the message with prio 1 and the message is placed in the queue. The message with priority 2 is shown again and its TTP continues.

TTP expires after 10 seconds but TTR continues for the message with priority 2. In this case, all messages have been shown 20 seconds each, and the oldest shown message with the highest priority is displayed (in this case, the message with priority 1). The handset does not indicate when it shows the message again, since it already has been shown and indicated once. The message with priority 2 is placed in the queue.

After 80 seconds, the TTR expires for the message with priority 2, and it is removed from the queue and is indicated as an unread message in the Messaging Inbox. When TTR expires for the message with priority 1, it is also indicated as an unread message in the Messaging Inbox.

NOTE: If no messages have been read/closed manually and TTP expired for each message, a dialogue window New message(s): [number of messages]. View now? is displayed. All messages are indicated as unread messages in the Messaging Inbox.

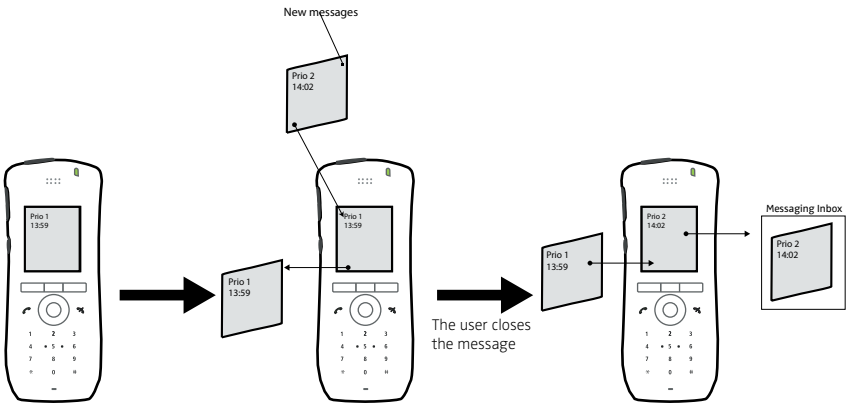
Example 4

This example describes the message handling with the following message settings:

- TTP= No prioritization
- TTR= Close manually

Tip: It is recommended to use these settings if messages regardless of priority shall be read in chronological order, that is, the newest message shall be displayed first.

Figure 4 Display messages in chronological order regardless of priority



In Figure 4, a message with priority 1 is received at 13:59. Another message with priority 2 is received at 14:02 and will be displayed. The message with priority 1 is put in the message queue. The user needs to close the current message (priority 2) to show the message (priority 1) in the queue. When closing the message (priority 2) it will be indicated as a read message in the Messaging Inbox.

6.8 Alarm Settings

NOTE: Applicable to WL3 Plus only.

The following alarm types can be configured; Push-button alarm, Test alarm, Emergency call alarm, Man-down and No-movement alarm.

6.8.1 Common Alarm Settings

These settings are common for all alarms sent from the handset.

1. Select Alarm > Common.
2. In the Stored alarm data field, enter data to be sent along with an alarm (optional).
3. In the Indicate initiated Alarm drop-down list, select one of the following:
   - On - The handset will beep and the LED will flash twice when an alarm is initiated.
   - Off - The handset will not indicate when an alarm is initiated.
4. In the Disable backlight during alarm drop-down list, select one of the following:
   - Yes - The display backlight will be left unchanged for 30 seconds after alarm
   - No - The display will light up after an alarm.

6.8.2 Push Button Alarm

1. Select “Alarm“.
2. Select “Multiple-press“ or “Long-press“.
3. In the Alarm type for multiple press drop-down list or Alarm type for long press drop-down list, select “Push button alarm 1“.
4. In the Number for automatic call after alarm field, enter the number to be called after an alarm has been activated (optional).
5. In the ALS drop-down list, select “Yes“ if an Acoustic Location Signal shall sound when the alarm has been activated.
6. In the Text indication for alarm on multiple press field or Text indication for alarm on long press, enter the text to be displayed in the handset when the alarm has been activated.
7. In the Mode for automatic call after alarm drop-down list, select one of the following:
   - Monitor - The loudspeaker is muted and the microphone is on.
   - Loudspeaker - The loudspeaker is turned on.
   - Ordinary - The loudspeaker is turned off.

6.8.3 Test Alarm

1. Select “Alarm“.
2. Select “Multiple-press“ or “Long-press“.

3. In the Alarm type for multiple press drop-down list or Alarm type for long press drop-down list, select “Test alarm“.
4. In the Number for automatic call after alarm field, enter the number to be called after an alarm has been activated (optional).
5. In the ALS drop-down list, select “Yes“ if an Acoustic Location Signal shall sound when the alarm has been activated.
6. In the Text indication for alarm on multiple press field or Text indication for alarm on long press, enter the text to be displayed in the handset when the alarm has been activated.
7. In the Mode for automatic call after alarm drop-down list, select one of the following:
   - Monitor - The loudspeaker is muted and the microphone is on.
   - Loudspeaker - The loudspeaker is turned on.
   - Ordinary - The loudspeaker is turned off.

6.8.4 Emergency Call Alarm

If enabled, an alarm will be sent when the user calls the defined Emergency number (for example 112).

1. Select Alarm > Emergency call.
2. In the Emergency call alarm drop-down list, select one of the following:
   - On - An alarm will be sent when the user calls the emergency number.
   - Off - No alarm will be sent when the user calls the emergency number.
3. In the Alarm type text field, enter the text to be displayed in the handset when the alarm has been activated.
4. Select Device > Call.
5. In the Emergency number field, enter the emergency number.
   If Emergency call alarm is enabled (see step 2), an alarm will be sent when the user calls this number.

6.8.5 Man-down and No-movement Alarm

NOTE: Applicable to WL3 Plus only.

The following parameters are available under the Numbers and Templates tabs in PDM and Device Manager:

Parameter name	Description	Value {default}
Man-down alarm	Enable or disable the alarm.	Enabled/Disabled {Disabled}
Man-down detection time	Delay before the alarm is activated.	5–255 s {7}
Man-down warning angle	The handset tilt from the vertical at which the alarm is activated.	45, 60 {45}
No-movement alarm	Enable or disable the alarm.	Enabled/Disabled {Disabled}
No-movement detection time	Delay before the alarm is activated.	5–255 s {30}
Warning phase duration	Delay before the activated alarm is sent.	1–255 s {7}
NM-MD extra delay used	Enable or disable the possibility of an extra delay.	Yes/No {No}
NM-MD extra delay time	Extra delay before the alarm is sent.	1–20 min {10}
ALS	Enable or disable the Acoustic Location Signal (ALS) after the alarm has been sent. **Note:** The ALS will not be activated if an automatic call is established after an alarm has been sent.	Yes/No {No}
Mode for automatic call after alarm	Off: no automatic call after alarm. Normal: the call is established as an ordinary call. Loudspeaker: the loudspeaker on the backside of the handset is turned on. Monitoring: a one-way speech channel is established, that is, the called part can only listen to an conversation.	Off, Normal, Loudspeaker, Monitoring {Off}
Turn off NM-MD during call	Enable or disable alarms during a call.	Yes/No {No}

Table 5

6.9 Telephony

The following parameters are required for the basic telephony settings.

6.9.1 Endpoint ID and Endpoint number

The Endpoint ID and Endpoint number will automatically be received when registering the handset in the VoWiFi system. The Endpoint ID is normally the user's name registered in the PBX and is displayed in the handset in idle mode. To change the name displayed in the handset, see Section 6.11.1, "User Display Text", on page 35.

NOTE: If the Endpoint ID needs to be changed, this must be also done in the PBX.

6.9.2 VoIP Protocol

A protocol is a set of standard rules for data traffic required to send information over a communication channel. Communication protocol is basically following certain rules so that the system works properly.

1. Select VOIP > General.
2. In the VoIP protocol drop-down list, select "SIP".
3. Continue with chapter SIP Protocol.

SIP Protocol

The following SIP protocol parameters are located under VoIP > SIP:

- SIP Transport – defines the protocol to use for SIP signaling, either UDP, TCP or TLS. The setting TLS requires the PBX certificate to be uploaded as root certificate.
- Outbound proxy mode – Set to "Yes" if the handsets are to connect with the SIP proxy through an outbound proxy. Set to "No" if the handsets are to connect directly with the SIP proxy (there may be two).
- Primary SIP proxy – defines the primary SIP proxy by a domain name, an IP address or an IP address together with a port number. The parameter is only visible if the parameter Outbound Proxy mode is set to "No".
- Secondary SIP proxy – defines the secondary SIP proxy by a domain name, an IP address or an IP address together with a port number. The parameter is only visible if the parameter Outbound Proxy mode is set to "No".
- Outbound proxy – defines the primary outbound proxy by a domain name, an IP address or an IP address together with a port number. The parameter is only visible if the parameter Outbound Proxy mode is set to "Yes".
- Listening port – the port that the handset listens to for incoming SIP traffic.

- SIP proxy ID – defines the SIP proxy by a domain name.
  NOTE: This parameter is only needed when an outbound proxy is defined. It may also be used to specify a domain name when parameters Primary SIP proxy and Secondary SIP proxy have been assigned IP-addresses.
- SIP proxy password
- Send DTMF using RFC 2833 or SIP INFO – this parameter defines which path the DTMF signaling should take. If set to “RFC 2833“, the DTMF signaling will be sent in the RTP stream, i.e. from handset to handset. If set to “SIP INFO”, the DTMF signaling will be sent using SIP signaling, i.e. via the PBX.
- Hold type – defines type of hold to send when the handset puts a call on hold. The selection depends on what type of hold the PBX support. For more information about what type of hold the PBX support, see the applicable documentation for the PBX.
- Registration identity – defines if the endpoint shall use its number or ID for the registration with the SIP proxy.
- Authentication identity – defines if the endpoint shall use its number or ID for the authentication with the SIP proxy.
- MOH locally – Music on hold is played by the handset i.e. if the PBX does not supply MOH the handset plays a tone when the call is on hold.
- Hold on transfer – puts a second call on hold before transfer, which is required by some SIP proxy servers.
- Direct signaling – defines whether calls originating from other sources than the configured SIP Proxy should be accepted or redirected using “USE PROXY“ message.
- SIP Register Expiration - Defines the number of seconds for register expiration to the PBX.

6.9.3 Codec

A codec encodes a stream or signal for transmission. Codecs are often used in streaming media applications. This setting defines how to packetize and compress the sound in a voice call.

1. Select VoIP > General.
2. In the Codec configuration drop-down list, select the applicable codec. The following are possible:
   - G.711 A-law (EU)
   - G.711 u-law (US)

- G.729
- G.729A
- G.722

3. In the Codec packetization time configuration drop-down list, select packetization time to use for speech (value between 10 and 60 ms). Default value is 20 ms.

6.9.4 Offer Secure RTP

When enabled, voice is sent over Secure RTP if the other party also supports Secure RTP.

SIP Protocol

1. Set parameter VoIP > SIP > SIP Transport to “TLS“.
2. Set parameter VoIP > General > Offer Secure RTP to “Yes“.
3. Select the preferred SRTP encryption by assigning a value to parameter VoIP > General > Secure RTP Crypto, which appears when enabling Secure RTP.

6.9.5 Internal Call Number Length

Defines the maximum number of digits to be interpreted as an internal call. “0“ means the same number of digits as in the endpoint number.

1. Select VoIP > General.
2. In the Internal call number length field, enter the number of digits.

6.9.6 Emergency Number

This is a phone number for emergency calls. It is always possible to call this number, regardless of whether phone-lock or key-lock is active or not.

1. Select Device > Call.
2. In the Emergency number field, enter the emergency number.

6.9.7 Voice Mail Number

In some systems it is needed to assign the handset number of the Voice Mail service.

1. Select Device > Message centre.
2. In the Voice mail number field, enter the number to the handset's voice mail inbox.

6.9.8 Message Centre Number

Specifies the number to the server for Message Waiting Indication (MWI) if included in the system.

1. Select Device > Message centre.
2. In the Message Centre number field, enter the number to the server.
3. In the Voice mail call clears MWI drop-down list, select "Enable" to clear MWI in the message centre when calling the defined voice mail number.

6.9.9 Max number of Call Completions

Specifies the maximum number of call back requests the handset can handle.

1. Select Device > Call.
2. In the Max number of call completions drop-down list, enter number of calls

6.9.10 Dial Pause Time

By adding a "P" to a phone number, a pause is added and will be activated when dialing. For how long is defined here.

1. Select Device > Call.
2. In the Dial pause time field, enter a pause time between 1 - 3 seconds.

6.9.11 Direct off Hook from Charger

The handset will automatically answer a call (that is; quick answer) when removed from the charger.

1. Select Device > General.
2. In the Direct off hook from charger drop-down list, select "Enable".

6.9.12 Replace Call Rejected with User Busy

Is used if the system does not support call rejected.

1. Select Device > General.
2. In the Replace Call Rejected with User Busy drop-down list, select “Enable”.

6.9.13 Busy on 1 / Disable call waiting

The default behavior is to indicate “call waiting” to the user. It is possible to change this behavior so that the next incoming call is rejected and a busy indication sent back to the SIP proxy.

1. Select Device > Call.
2. In the Busy on 1 / Disable call waiting drop-down list, select “Yes”.

6.9.14 Calling Line Restriction

The handset may be configured to hide the calling number and name to the called party.

1. Select Device > Call.
2. In the CLIR (Calling Line Information Restriction) drop-down list, select “On”.

6.10 Regional Settings

This section includes settings suitable for a specific region or country.

6.10.1 Set Time & Date

1. Select Device > General.
2. In the Time zone drop-down list, select the applicable time zone.
3. In the NTP server field, enter the address to the time server. If not set, the IP PBX address is used.
4. Select Device > Settings.
5. In the Time format drop-down list, select the applicable time format:
   12h (for example 11:59 am/pm)
   24h (for example 23:59)

6. In the Date format drop-down list, select the applicable date format:
   DD/MM/YYYY, for example, 31/01/2010 (also called Europe)
   MM/DD/YYYY, for example, 01/31/2010 (also called US)
   YYYY-MM-DD, for example, 2010-01-31 (ISO 8601)
   MMM DD YYYY, for example, Jan 31 2010
   DD MMM YY, for example, 31 Jan 10
   DD.MM.YYYY, for example, 31.01.2010
   DD-MM-YYYY, for example, 31-01-2010

6.10.2 Select Default Language

Defines he default operating language for the handset. This setting can later be changed by the user.

1. Select Device > Settings.
2. In the Language drop-down list, select the language to be used.
3. If the downloaded language is selected, it might be needed to select matching characters as text input language, and the sort order in the phonebook
   In the Input Language drop-down list, select the text input language to be used.

NOTE: This parameter is only applicable for the downloaded language and cannot be changed by the user. See Section 6.5.10, “Uploadable Language”, on page 16 for more information.

6.10.3 Dialing Tone Pattern

Defines which tone pattern to use when dialing.

1. Select Audio > General.
2. In the Dialing tone pattern drop-down list, select the applicable region.

6.11 Display

6.11.1 User Display Text

Defines a text to be shown in the display in idle mode instead of the endpoint ID. If nothing is entered in this text field, the endpoint ID will be shown.

1. Select Device > Settings.
2. In the User display text field, enter the text to be displayed.

6.11.2 Rotate Display Text

The handset may be configured to show the contents of the display (except the soft key bar) upside-down at incoming calls or messages.

1. Select Device > Settings > Display.
2. In the Rotate display text list, choose Normal or Inverted.

6.11.3 Font style

The display font style can be changed to bold for increased readability.

1. Select Device > Settings.
2. In the Font style list, choose Normal or Bold.

6.11.4 Backlight Timeout

Numbers of seconds before the backlight is turned off.

1. Select Device > General.
2. In the Backlight timeout field, enter number of seconds before the backlight is turned off when handset is idle.

6.11.5 Brightness

1. Select Device > Settings.
2. In the Brightness drop-down list, select one of the following:
   - Normal - maximum backlight will be used.
   - Power save - reduced backlight will be used.

6.11.6 Screen Saver

1. Select Device > Settings.
2. In the Screen saver drop-down list, select one of the following:

- Information - time and status will be displayed when the screen saver is activated.
- Black - no information will be displayed when the screen saver is activated.

6.12 Menu Operation

6.12.1 Hide Menu Items

It is possible to hide menu items for the users. To hide or show a menu item, do the following:

1. Select Customization > Visibility.
2. Select “Hide”, “Show”, or “Read only“ for the applicable menu item in the drop-down list. If “Read only“ is selected, the menu item will be visible in the handset, but cannot be edited by the user. The following items can be hidden:
   - Connections (Network, Headset etc.)
   - Calls
   - Contacts
   - Short cuts (Soft keys, Hot keys etc.)
   - Messaging
   - Services (only WL3 Plus)
   - Profiles
   - Settings (Sounds, Display, Language etc.)

6.12.2 Services

NOTE: Applicable to WL3 Plus only.

It is possible to configure up to ten services that can be accessed from the handset’s Services menu.

1. Select “Services“.
2. Select between 1 - 10.

3. In the Service name, enter the name of the service to be displayed in the handset's Service menu.
4. Select the service to be used:
   - Phone Call
   - Send a message to predefined number (prompt for the message text)
   - Send data to message service centre (predefined data and/or prompt for the data)
   - Edit alarm data
   - PTT
5. In the Service user data field, enter the data to be sent/dialed when using the service.

NOTE: This field is not applicable for PTT.

---

6. In the Service prefix for user data field, enter the prefix for the service user data (if needed).
7. In the Service index field, enter the corresponding index used for PTT. For example, if PTT group 1 is configured (located under Push-To-Talk > **1**), the service index must be set to **1**.

   NOTE: This field is only applicable for PTT.

   If the PTT is not configured, continue, with Section 6.13, "Push-To-Talk (PTT) Group Call", on page 38.

Tip: It is also possible to configure soft keys to reach services quickly, see Section 6.5.12, "Short cuts", on page 16.

6.13 Push-To-Talk (PTT) Group Call

NOTE: Applicable for WL3 Plus only.

To be able to configure a PTT session, the following must be known:

- The group number to the PTT group (defined in the).
- The phone number to the conference bridge.

Tip: For more information about the PTT function, see also User Manual for the WL 3 / WL 3 Plus Handset.

NOTE: If Music on Hold (MOH) is used in the system it can affect an ongoing PTT group call. If someone in the group conference answers another incoming call, MOH will be played for the whole group.

---

1. Select Push-To-Talk > X (where X represents 1-10).
2. In the Session name field, enter a name to identify the PTT session.
3. In the Group number field, enter the number to the PTT conference group.
4. In the Display text field, enter a text to be shown in the display during the PTT session.
5. In the PTT session signal drop-down list, select the indication of the PTT session.
6. In the Conference number field, enter the phone number to the conference bridge.
7. In the Answer mode drop-down list, select the answer mode for the PTT session.
8. In the Speaker mode drop-down list, select the speaker mode for the PTT session.
9. A Service must be configured to access the PTT session from the handset. If not configured, continue with Section 6.12.2, “Services”, on page 37.

6.14 Location

NOTE: Applicable to WL3 Plus only.

Two types of location are supported, either a basic location solution that gives an approximate location using Access Point (AP) location, or a personal security solution that gives a more accurate location using a third-party Real-Time Location System (RTLS) solution.

The following RTLS solutions are supported:

- Cisco RTLS Solution
  In order to use the Cisco RTLS solution, a Cisco Mobility Services Engine must be used and configurations in the handset are required.

- Ekahau RTLS Solution
  In order to use the Ekahau RTLS solution, the handset must have the Ekahau license (see Section 5.1.7, “Upgrade Handset Functionality using License”, on page 5) and also be configured.

6.14.1 Configure Handset for Cisco/Ekahau RTLS Solution

1. Select Location > Common.
2. In the Location scanning drop-down list, select “Enable“.
3. In the Scanning interval[1] field, set the time between the scanning periods.
4. In the Scans per scanning period[1] drop-down list, select how many scans that should be performed during each scanning period.

If the Ekahau RTLS solution is used, also perform the steps 5 - 8.

5. Select Location > Ekahau.
6. In the EKAHAU license drop-down list, select “Yes“. Additional parameters are shown.
7. In the IP address field, enter the IP address to the Ekahau location appliance.
8. In the Listening port field, enter the port the location appliance is listening to.

1. Note that close scanning periods, and frequently scans per period, will shorten the battery time.

7 Use Handset to Verify the VoWiFi System Deployment

7.1 Site Survey Tool

It is recommended to do site surveys with the built-in tools in the handset.

This provides a true measurement of the RF environment based upon the radio of the handset. Wireless analyzers may be used to provide additional assistance during a site survey.

7.2 Scan the Channels

To be able to use the site survey functions in the handset, it must be configured correctly.

Default configuration for the handset is to use channels 1, 6 and 11. If the handset is intended for site survey use, scanning all channels will be limited to 1, 6 and 11.

The table is upgraded regularly, starting with scanning channel 1, then 6 and last 11. In between, the handset is in sleeping mode. The handset consults this table when making roaming decisions.

It is possible to scan all 802.11b/g/n channels, or scan all 802.11a/n channels by setting the parameter 802.11b/g/n channels or 802.11a/n channels to “All”, respectively.

For 802.11b/g/n channels, it is strongly recommended to set back the handset to “1,6,11” before normal use. For 802.11a/n channels, it is strongly recommended to set back the handset to “UNII-1” before normal use.

The World mode regulatory domain will also affect which channels that may be used. To scan channels 1-11 it is recommended that the handset is configured so the “World mode regulatory domain” parameter is set to “USA”. If also scanning of channels 12 and 13 is of interest use value “ETSI”.

There are three ways of scanning channels:

- Scan all channels
- Scan a specific channel

7.2.1 Scan all Channels

This gives a filtered list of the channels in the SSID found during the scan.

1. There are two options to access the Site Survey Tool menu:
   - If the handset has been factory reset or not configured; in idle mode, enter “40022“, select “Site survey tool“.
   - If the handset has been configured; in idle mode, enter “*#77#”.
2. Select “Scan all channels”.
3. Select the SSID to display the associated AP.
4. Select an AP to display information such as SSID, Channel, MAC address, Beacon period, QoS, and Privacy.

7.2.2 Scan a Specific Channel

This gives a list of all the APs found on that channel in the specified SSID.

1. There are two options to access the Site Survey Tool menu:
   - If the handset has been factory reset or not configured; in idle mode, enter “40022“, select “Site survey tool“.
   - If the handset has been configured; in idle mode, enter “*#77#”.
2. Select “Scan selected channel“.
3. Enter the channel to be scanned.
4. Select an AP to display information such as SSID, Channel, MAC address, Beacon period, QoS, and Privacy.

7.3 Range Beep

The range beep function enables a beep to be played whenever the handset experiences a filtered field strength of below the configured value (default -70 dBm) from the currently associated access point. Since the value is filtered, sudden drops in field strength caused by the environment, for example walking through a door into a room, will be delayed, thus it is important to walk slowly through the site to cover all weak spots.

7.3.1 Configurable RSSI Threshold

The RSSI threshold of the handset is set to -70 dBm (default). In the site survey menu there is the possibility to change the RSSI threshold. This is useful if a specific area is designed to have another coverage level than -70 dBm.

1. There are two options to access the Site Survey Tool menu:
   - If the handset has been factory reset or not configured; in idle mode, enter “40022“, select “Site survey tool“.
   - If the handset has been configured; in idle mode, enter “*#77#”.
2. Select “Range beep level”.
3. Enter the new RSSI threshold and press “OK”.

7.3.2 Range Beep on a Configurable RSSI Threshold

A beep is played when the signal goes below the selected threshold.

1. There are two options to access the Site Survey Tool menu:
   - If the handset has been factory reset or not configured; in idle mode, enter “40022“, select “Site survey tool“.
   - If the handset has been configured; in idle mode, enter “*#77#”.
2. Select “Range beep“.
3. Select one of the following:
   - On - Activates the range beeps
   - Off - Deactivates the range beeps

8 Handset Internal Web Administration Page

The internal web administration page for the handset makes it possible to:

- View general information about a handset
- Troubleshoot the VoWiFi System.
- View statistics

8.1 Access the Handset´s Internal Web Administration page

In a web browser, enter the handset´s IP address to access the internal web administration page for the handset. The IP address can be found in the handset´s menu (Settings >Device info >Network info).

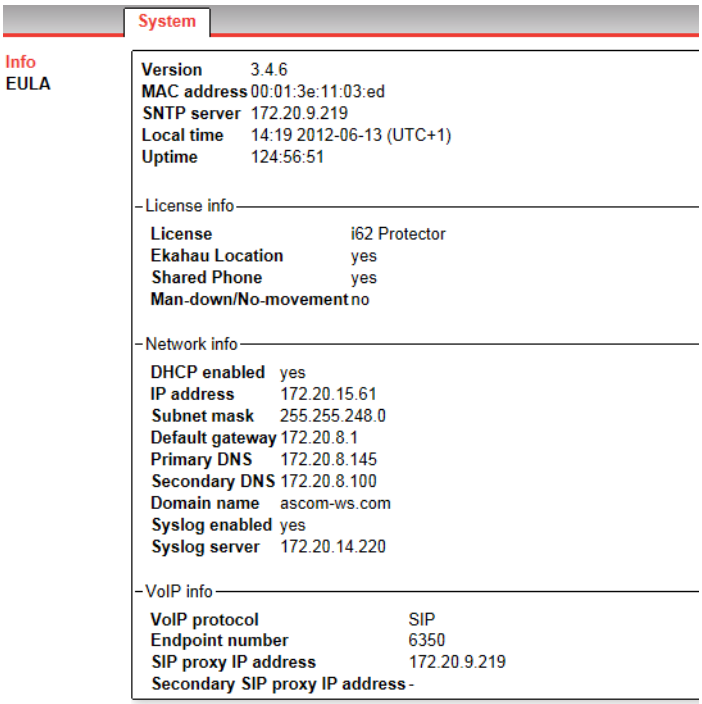
8.1.1 General View

In the “System” tab, the following information is shown:

- Software version
- MAC address
- SNTP server
- Local time
- Uptime
- License information
- Network information
- VoIP information
- SIP proxyIP address

- End User License Agreement (EULA).

Figure 1 Internal Web Administration Page



Enter administration user name and administration password to access further pages.

Default user name and password for an administrator:

- User name: admin
- Password: changeme

NOTE: If the user name or password is forgotten, it can be changed in the PDM.

8.1.2 Troubleshoot View

1. In a web browser, enter the handset´s IP address to access the internal web administration page for the handset. The IP address can be found in the handset´s menu (Settings >Device info >Network info).
2. Click on “Troubleshoot“.
3. If needed, enter administration user name and administration password to access further pages.

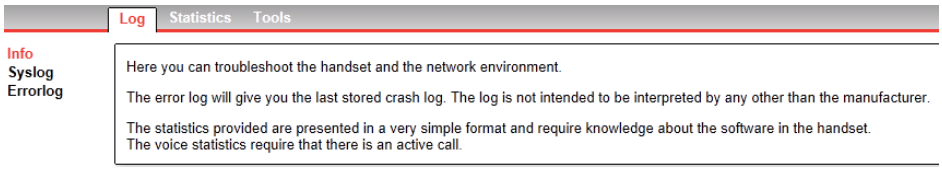
   Default user name and password for an administrator:

- User name: admin
- Password: changeme

In the “Log”, “Statistics” and “Tools” Tab, the following information is available:

- Syslog
- Errorlog
- Voice calls statistics
- WLAN connectivity statistics
- Network diagnostics tools (Ping and Traceroute)

Figure 2 Internal Web Administration Page - Troubleshoot View


Log
Statistics
Tools
Info
Syslog
Errorlog
Here you can troubleshoot the handset and the network environment.
The error log will give you the last stored crash log. The log is not intended to be interpreted by any other than the manufacturer.
The statistics provided are presented in a very simple format and require knowledge about the software in the handset.
The voice statistics require that there is an active call.

8.2 Change Administration Password

NOTE: The administration password can be changed only via the PDM.

1. Open the PDM.
2. Select Device > General.
3. In the Administration user name field, enter user name.
4. In the Administration password field, enter password.

9 Administration

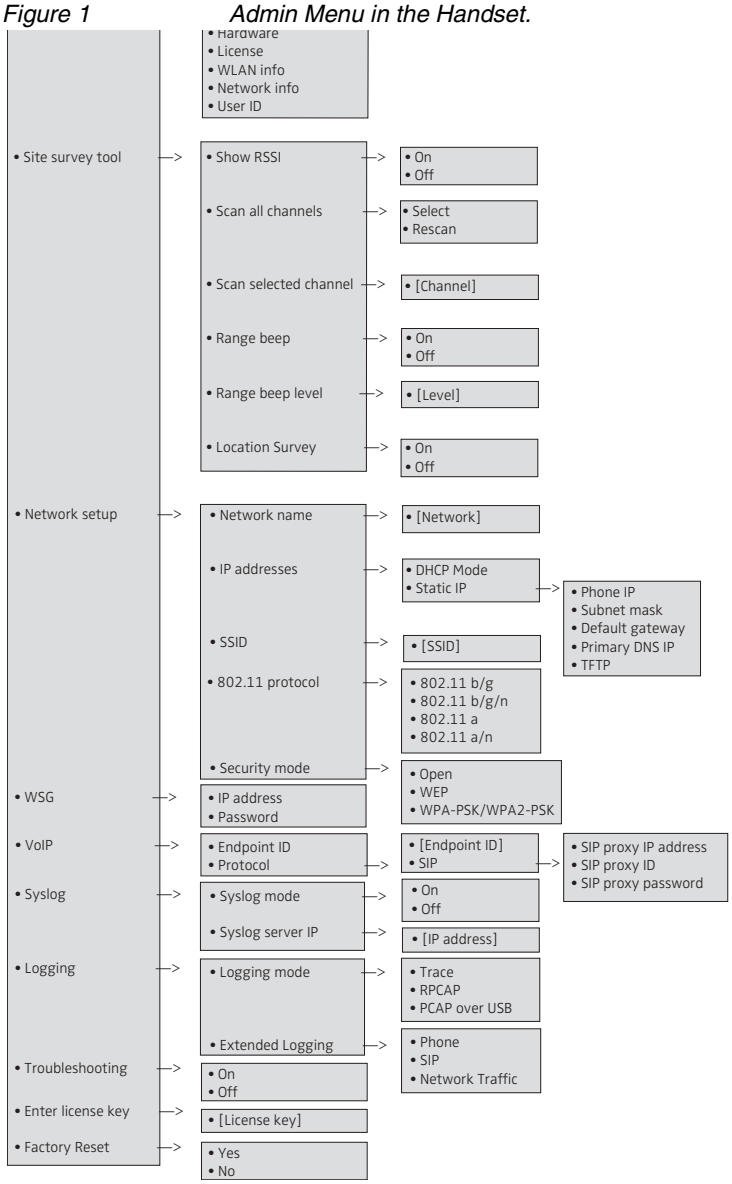
9.1 Admin Menu Tree

The handset has a hidden menu for system administrators. The Admin menu contains:

- Software and hardware information
- WLAN, network, system, and license information
- Site survey tool
- Network setup menus
- Factory reset option

To activate the Admin Menu, select Menu > Settings and press 40022.

Figure 1 Admin Menu in the Handset.



9.2 Quick Access to the Handset's Device Information

For quick access to device information, short codes can be used from the idle menu. To display this information, enter the following codes in the handset.

Information	Code
Software version	*#34# > Software
Hardware version	*#34# > Hardware
IP address	*#34# > Network info
Subnet mask	*#34# > Network info
Default gateway	*#34# > Network info
MAC address	*#34# > Hardware
Current license	*#34# > License
Current BSSID	*#76#
Current ESSID	*#76# or *#34#
Current RSSI	*#76#
Current channel	*#76#
Site survey functions	*#77#

Table 1

NOTE: Other settings and information can be found on the internal web administration page, refer to chapter Section , "Handset Internal Web Administration Page", on page 1.

9.3 LED indications

The following table shows the LED indications that are used for the handset.

LED indication	Description
None	Switched off.
Green, fixed	Handset fully charged and in charger.
Green, flashing, slow	Switched on, but not in charger.
Orange, fixed	Charging
Orange, flashing	Low battery
Red, fixed	Software error. Service needed.
Red, flashing	Very low battery
Red, flashing, slow:	No network connection.

Table 2

10 Troubleshooting

This section contains information on how to solve common operational problems, and information on warnings you may receive.

Go through the following lists if you encounter any problems. If this checklist does not solve the problem, contact the system administrator.

If other users have similar problems, there may be a system error.

10.1 Fault Symptoms

If any of the following Fault Symptoms occur, follow the instructions below.

Fault	Probable cause	Action or comment
The display stays dark	Low battery level or faulty handset.	Charge the battery. If the handset does not work after charging, contact the system administrator.
There is no ring signal	“Ringer off“ icon is on, or ringer volume is set to silent, or faulty handset.	Press and hold the Mute key, or increase volume (in the handset, select Settings > Sound & Alerts > Volume) or contact the system administrator.
Connected call but no sound or one way sound	IP addressing fault, or muted or bad speaker/ microphone	1) Note the IP address of the handset. Turn the handset off and ping the IP address. If something is found, the problem is an IP address conflict. 2) Check if the handsets are muted. 3) Use a headset to eliminate bad speakers/microphone.
Voice quality is bad	Increased traffic load or interference.	1) Check if QoS is working in both directions. Voice traffic should be prioritized on both the LAN and the WLAN. 2) Connect to other phones (wired, analogue or external) to determine if it is the other end that may cause bad quality. 3) Do a site survey and check for areas with under/over coverage and other interfering 802.11 systems. 4) Do a network performance test to ensure the wired LAN/backbone has adequate capacity. 5) Use a spectrum analyzer and look for non 802.11 interference.

Table 1

Fault	Probable cause	Action or comment
Battery life is bad	DTIM might not be set correctly. U-APSD is not used. Cisco/Ekahau location client settings need to be changed.	1) Check “Beacon interval” and “DTIM” settings in the AP. 2) Verify the coverage, since low signal strength will make the handset to constantly search for other APs and thereby consuming more power. 3) Use a sniffer and check the amount of broadcast traffic that is transmitted on the WLAN. 4) Check if correct models of the chargers are used. 5) Verify with another battery. 6) If the system is supposed to use U-APSD for voice calls check the voice power save mode parameter in the PDM. 7) If using Cisco/Ekahau location client, change the settings.

Table 1

10.2 Display Information

The following error messages can be shown in the handset display:

Display shows	Probable cause	Action or comment
No access	The handset is in range, but has no access rights. Handset has found and associated to the WLAN (a wireless network with the configured SSID and correct security settings). But it cannot connect to the gatekeeper or the WSG.	Switch off the handset and then switch it on again. If this does not work, contact the system administrator. 1) Check if the handset has an IP address by entering the “Network info” screen. If not check the WEP key if used or WPA/WPA2 passphrase. 2) If using WEP, double-check the key if the handset has no IP address. If you have a wireless sniffer, configure it to the correct key and try to decode packets both from and to the handset. 3) Check the Gateway address. Try to ping the gateway from another PC. 4) Check the WSGaddress. Try to ping the WSG from another PC.

Table 2

Display shows	Probable cause	Action or comment
No network. (The handset beeps once a minute with a low tone followed by a high tone (during max 30 minutes). If the vibrator is enabled, it vibrates after the last beep.)	The handset is out of coverage, or faulty handset. The handset cannot find the wireless infrastructure with settings matching those configured in the handset.	The beeps can be stopped with the mute button. Then go into range. Note: When re-entering the coverage area it can take a couple of minutes before the handset automatically has registered into the system. If this does not work, contact the system administrator. 1) Check the SSID. The SSID configured in the handset must be identical to the SSID configured in the system infrastructure. 2) Check the security settings. The security settings, that is, authentication and encryption must match the settings in the system infrastructure. 3) Check for 802.11d multi regulatory domain settings. The handset (software version 2.x.x) must be able to detect in which country it is located to use the correct channel and transmit power settings. Later versions have a parameter specifying if 802.11d should be used or not. This is provided by the infrastructure according to the 802.11d standard. 4) Check which channels are used. The handset uses by default channel 1, 6 and 11. If the infrastructure is configured to use any other channel, change it to use only 1, 6 and 11 as this is the recommended setting. 5) Check that the correct Network (A, B, C or D) setting is selected.
Voice only	The handset is configured to use both a gatekeeper and a WSG, but has lost contact with the WSG.	1) Check the WSG address. Try to ping the WSG from another PC. 2) Remove the handset from the DP1 Desktop Programmer. When connected to the PDM via USB on the DP1 Desktop Programmer, the handset cannot connect to the WSG and may then show “Voice only”. 3) If messaging is not used in the system, verify that the WSG address is configured to 0.0.0.0.
Limited mode	The PBX is in “Server mode backup”.	

Table 2

Display shows	Probable cause	Action or comment
Messaging only	The handset is configured to use both a gatekeeper and an WSG but has lost contact with the gatekeeper.	1) Check the Gateway address. Try to ping the gateway from another wireless client. 2) Try to send a message. The idle connection check interval to the is much longer than to the gateway. Sometimes when all network connection is lost the handset will show “Messaging only” for quite some time, because it discovers it has lost connection to the gateway much faster than it discovers loss of connection to the WSG. In this case the handset will eventually change to “No access”. 3) If the handset is supposed to use Gatekeeper discovery, verify that the configured Gatekeeper IP address is 0.0.0.0. 4) Check the Endpoint number and the Endpoint ID. If both are configured, they MUST match the Endpoint ID and Endpoint number registered in the IP PBX. Clear the Endpoint ID.
SERVICE NEEDED Parameters corrupt Note: This display message is only shown in English.	Faulty handset.	Select the reset option on the middle soft key. If this is not available or the problem persists send the handset for service.
Enter PIN code	Phone lock is activated.	Enter the required PIN code. If the PIN code has been lost, enter a new PIN code via the PDMWSG or do a factory reset via the PDMWSG.
Battery low, charge now	The battery level is low.	Charge the handset, or replace or charge the battery.
Phonebook is not available at the moment.	The phonebook is not activated or does not respond.	Try again later or if the fault persists do a factory reset via the admin menu or via the PDMWSG. Note that it may take several minutes for the phonebook to be available if there are many entries in Contacts and/or company phonebook.
Voice mail number not defined	There is no Voice mail number defined in the handset.	Define a Voice mail number via the PDMWSG.

Table 2

10.3 Troubleshooting from the handset Internal Web Administration Page

It is possible to view statistics for Voice and WLAN connectivity and to create debug and error logs from the internal web administration page. The logs and the statistics can then be interpreted by your supplier.

1. In a web browser, enter the handset´s IP address to access the internal web administration page for the handset. The IP address can be found in the handset´s menu (Settings >Device info >Network info).
2. Click “Troubleshoot“.

   Refer also to Section 8.1.2, “Troubleshoot View”, on page 2.

A Working with Templates

This section describes how to manage templates when using both the PDM and the Device Manager in the WSG.

When creating a template in the PDM and in the Device Manager, the templates must be identical to avoid that the template's parameters override each other when synchronizing the handset with PDM or Device Manager.

A template can simply be copied between PDM and Device Manager.

The following workflow describes how to create a template in the Device Manager and then copy it to the PDM. However, it is also possible to create a template in PDM and copy it to the Device Manager.

A.1 Create a Template

1. Open the Device Manager in the WSG.
2. Select the "Templates" tab and open the menu "Template > New...". The New Template window is opened.
3. Select the corresponding device type and parameter version that matches the software version installed on the handset. Give the template a descriptive name.

   The parameters that are not part of the template will be left unchanged on the handset. The parameter version of an installed handset is visible under the Numbers tab or the Devices tab.
4. Click "OK".
5. Select the checkbox of each parameter that you want to be part of this template and enter the proper value.
6. Click "OK" to save the template.

A.2 Export a Template

1. Open the Device Manager in the WSG.
2. Select the "Templates" tab.
3. Select the template to be exported.
4. Select "Template" > "Export". Alternatively, right-click the template and select "Export...". The Export templates window is opened.
5. Give the template (*.tpl) a descriptive name and click "Save".

See also Section A.3, “Import a Parameter File”, on page 2.

A.3 Import a Parameter File

The parameter version file (*.def) the template is based on, must have been imported to the PDM to be able to import the template later on. If the parameter file is not imported, do as follows:

1. Open the PDM.
2. Select “File“ > “File management“.
3. Select the “Parameter definition“ tab.
4. Click “Add“. The Import files window is opened.
5. Locate the parameter file (*.def), or the package file (*.pkg) where the parameter file is included. Ask you supplier.
6. Click “Open“ to import the file.

A.4 Import a Template

1. Open the PDM.
2. Select “File“ > “Import“ > “Templates...“. The Import templates window is opened.
3. Locate the template to be imported.
4. Click “Open“ to import the template.

B Configuring OpenStage WL3 Device to be used at OpenScape Voice (OSV)

B.1 Prerequisites

1. Create all the subscribers using the OpenScape Voice Assistant.
2. Security > SIP Authentication needed if the Digest Authentication is turned on the OSV.
3. Configure OpenStage WL3 according OpenStage WL3 configuration manual Chapter 4 to 6.

   Please consider the OSV numbering plan when defining the OpenStage WL3 numbers (chapter 4.1.3 or 4.2); the number, i.e. the Endpoint Number will be later on the registration identity!

B.2 WL3 Steps

B.2.1 Setup TCP Subscriber

Numbers tab -> Right click on the Number you want to configure the parameters and select Edit Parameters.

VoIP > General

1. **Offer Secure RTP:** No
2. **Endpoint number:** Subscriber Number (Automatically populated)
   - **Endpoint ID:** depending on OSV setup.
     Registration identity and Authentication identity is the same:
     Subscriber Number
   - Authentication identity is different to Registration identity:
     ID to be used for SIP authentication

VoIP > SIP

1. **SIP Transport:** TCP
2. **Validate Server certificate:** No
3. **Outbound Proxy mode:** No (Yes, if the subscriber is a Branch Subscriber)
4. **Primary SIP Proxy:** OSV SIP Signaling IP/FQDN

5. **Listening Port:** TCP Port (Example: 5060)
6. **SIP Proxy Password:** SIP Authentication password (This is the same password that is configured for Subscriber in Assistant for Realm Settings (Subscriber - > SIP Authentication -> Password))
7. **Registration identity:** Endpoint Number
8. **Authentication identity:** Endpoint ID (see above VoIP > General #3)
9. **Direct Signaling:** Yes

B.2.2 Setup TLS Subscriber

VoIP > General

1. **Offer Secure RTP:** yes
2. **Endpoint Number/ID:** Subscriber Number (Automatically Populated)
3. **Endpoint ID:** depending on OSV setup.
   - Registration identity and Authentication identity is the same: Subscriber Number
   - Authentication identity is different to Registration identity: ID to be used for SIP authentication

VoIP > SIP

1. **SIP Transport:** TLS
2. **Validate Server certificate:** No (If yes, follow the Section 1.1.2.3)
3. **Outbound Proxy mode:** No (Yes, if the subscriber is a Branch Subscriber)
4. **Primary SIP Proxy:** OSV SIP Signaling IP/FQDN
5. **Listening Port:** TLS Port (Example: 5061)
6. **SIP Proxy Password:** SIP Authentication password (This is the same password that is configured for Subscriber in Assistant for Realm Settings (Subscriber -> SIP Authentication -> Password))
7. **Registration identity:** Endpoint Number
8. **Authentication identity:** Endpoint ID (see above VoIP > General #3)
9. **Direct Signaling:** Yes

B.2.3 Setup the TLS Subscriber with Root Certificate

Follow all the above steps in Section 1.1.2.2

1. **Validate Server Certificate:** Yes
2. Import the certificate by do the following:
   a) In the Numbers tab, right-click the handset's number and select "Edit certificates".
   b) An Edit certificate window opens.
   c) In the Root tab and Client tab, click "Edit" and select the certificates to import.
   d) Click "Close"

B.2.4 Setup a Branch Subscriber

Follow 1.1.2.1 for TCP and 1.1.2.2 for TLS and additional to those settings follow below:

VoIP -> SIP

1. **Outbound proxy mode:** Yes
2. **Outbound proxy:** Branch IP/FQDN

Abbreviations/Glossary

This table shows some important abbreviations and glossary.

Abbreviation	Definition
802.11a	IEEE 802.11 standard for transmission rate of up to 54Mbps, operates in the 5GHz spectrum.
802.11b	IEEE 802.11 standard for transmission rate of up to 11Mbps, operates in the 2.4GHz spectrum.
802.11g	IEEE 802.11 standard for transmission rate of up to 54Mbps, operates in the 2.4GHz spectrum.
802.11d	IEEE 802.11 standard for regulatory domains.
802.11e	IEEE 802.11 standard that defines Quality of Service (QoS) for WLAN.
802.11i	Standard for security improvements for 802.11.
802.11n	IEEE 802.11 standard for transmission rate of up to 100 Mbps, operates in the 2.4GHz and 5GHz bands.
802.11D	IEEE MAC Bridges standard (interworking for 802.11 among others).
802.11X	IEEE standard for port-based Network Access Control (authentication).
Ad-hoc WLAN	A WLAN between two wireless capable devices (normally PCs), where no AP is involved.
AES	Advanced Encryption Standard.
ALS	Acoustic Location Signal
AP	Access Point
BSS	Basic Service Set. A WLAN with at least one AP that is configured for it.
BSSID	Basic Service Set Identifier. Hard coded name of an ad-hoc WLAN, usually the MAC address of the radio. One type of SSID (the other being ESSID).
CCX	Cisco Compatible eXtension
Centralized Management	Centralized Management makes it possible to configure handsets without the administrator needs to collect them.
Device Manager	Application for management of portables, editing of parameters and updating the portables with new software, running on WSG.
DHCP	Dynamic Host Configuration Protocol. Used to send config parameters to TCP/IP clients.
DNS	Domain Name System
DSCP	Differentiated Services Code Point. QoS on the Network Layer. Used both for WLANS and LANs.
DTIM	Delivery Traffic Indication Message
EAP	Extensible Authentication Protocol.
EAP-FAST	Flexible Authentication via secure tunneling.

Abbreviation	Definition
EAP-TLS	EAP-Transport Layer Security.
ELISE	Embedded LInux SErver: A hardware platform used for WSG modules
ESS	Extended Service Set. WLAN with multiple APs sharing the same SSID.
ESSID	Extended Service Set Identifier. Identifying name of a WLAN - strictly it is the identifying name of an AP and distinguishes WLANS from another. ESSID is one type of SSID (the other being BSSID).
IM	Interactive Messaging makes it possible to access information from an application and control it by selecting a choice received in a message.
License	An authorization to use a licensed function.
MAC	Medium Access Control.
MWI	Message Waiting Indication
NTP	Network Time Protocol
OTA	Over The Air
PBX	Private Branch Exchange: Telephone system within an enterprise that switches calls between local lines and allows all users to share a certain number of external lines.
PEAP	Protected Extensible Authentication Protocol.
PDM	Portable Device Manager Used for management of portables, editing of parameters and updating the portables with new software.
PEAP	Protected Extensible Authentication Protocol.
PRI	Primary Rate Interfaces
RSSI	Received Signal Strength Indication.
RTLS	Real-Time Location System
RTS	Request-To-Send.
PTT	Push-To-Talk
Services	Services are predefined functions such as Phone Call, Send Data, Send Message etc. that can be accessible from the Service menu.
SIP	Session Initiation Protocol
SSID	Service Set Identifier. User friendly name of a WLAN. Identifier attached to packets sent over a WLAN that acts as a password. Daily used term for ESSID in a wireless ESS topology.
STA	Station. Client in a WiFi network.
QoS	Quality of Service: Defines to what extent transmission rates, error rates etc. are guaranteed in advance.
UP 6	User Presence (value between 0-7). Wireless QoS at the MAC Layer.
VoIP	Voice over IP.
VoWiFi	Wireless version of VoIP and refers to an IEEE 802.11a, b, g and n network.

Abbreviation	Definition
VoWLAN	Voice over WLAN.
WEP	Wired Equivalent Privacy.
Wi-Fi	Wireless Fidelity. Has become a name for wireless LAN networks. Originator is Wi-Fi Alliance.
WLAN	Wireless Local Area Network. Refers to an IEEE 802.11a, b, g and n network.
WMM	Wi-Fi Multimedia. A Wi-Fi Alliance interoperability certification, based on the IEEE 802.11e standard. Provides basic QoS features to IEEE 802.11 networks.
WPA/WPA2	Wi-Fi Protected Access 2. Security method based on 802.11i standard for wireless networks (data protection and network access control).
WSG	OpenStage WL3 Wireless Service Gateway: Module that enables wireless services to and from the handsets in a WLAN system. It also includes the Device Manager.